

# HITACHI

## SM00033

## AV3000E



### SERVICE MANUAL MANUEL D'ENTRETIEN WARTUNGSHANDBUCH

#### CAUTION:

Before servicing this chassis, it is important that the service technician read the "Safety Precautions" and "Product Safety Notices" in this service manual.

#### ATTENTION:

Avant d'effectuer l'entretien du châassis, le technicien doit lire les «Précautions de sécurité» et les «Notices de sécurité du produit» présentés dans le présent manuel.

#### VORSICHT:

Vor Öffnen des Gehäuses hat der Service-Ingenieur die „Sicherheitshinweise“ und „Hinweise zur Produktsicherheit“ in diesem Wartungshandbuch zu lesen.

Data contained within this Service manual is subject to alteration for improvement.

Les données fournies dans le présent manuel d'entretien peuvent faire l'objet de modifications en vue de perfectionner le produit.

Die in diesem Wartungshandbuch enthaltenen Spezifikationen können sich zwecks Verbesserungen ändern.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT


PLASMA TV  
OCTOBER 2002



## SAFETY PRECAUTIONS

**WARNING:** The following precautions must be observed.

### **ALL PRODUCTS**

1. Before any service is performed on the chassis an isolation transformer should be inserted between the power line and the product.
2. When replacing the chassis in the cabinet, ensure all the protective devices are put back in place.
3. When service is required, observe the original lead dressing. Extra precaution should be taken to ensure correct lead dressing in any high voltage circuitry area.
4. Many electrical and mechanical parts in HITACHI products have special safety related characteristics. These characteristics are often not evident from visual inspection, nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified by marking with a  on the schematics and the replacement parts list.  
The use of a substitute replacement component that does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list, may create electrical shock, fire, X-radiation, or other hazards.
5. Always replace original spacers and maintain lead lengths. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Insulation resistance should not be less than  $2M\Omega$  at 500V DC between the main poles and any accessible metal parts.
7. No flashover or breakdown should occur during the dielectric strength test, applying 3KV AC or 4.25KV DC for two seconds between the main poles and accessible metal parts.
8. Before returning a serviced product to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock. The service technician must make sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently damaged during servicing.

### **CE MARK**

1. HITACHI products may contain the CE mark on the rating plate indicating that the product contains parts that have been specifically approved to provide electromagnetic compatibility to designated levels.
2. When replacing any part in this product, please use only the correct part itemised in the parts list to ensure this standard is maintained, and take care to replace lead dressing to its original state, as this can have a bearing on the electromagnetic radiation/immunity.

### **LASERS**

If the product contains a laser avoid direct exposure to the beam when the cover is open or when interlocks are defeated or have failed.



## LEAD FREE SOLDER

This product uses lead free (unleaded) solder to help preserve the environment. Please read these instructions before attempting any soldering work.

### Caution:

Always wear safety glasses to prevent fumes or molten solder from getting into the eyes. Lead free solder can splatter at high temperatures (600°C).

### Lead Free Solder Indicator

Printed circuit board assemblies using lead free solder shown below are engraved with an "F" following Board Name.

### Properties of Lead Free Solder

The melting point of lead free solder is 40~50°C higher than leaded solder.

### When Servicing Solder

Solder with an alloy composition of Sn-3.0Ag-0.5Cu or Sn-0.7Cu is recommended.

Although servicing with leaded solder is possible there are a few precautions that have to be taken. (Not taking these precautions may cause the solder not to harden properly and lead to consequent malfunctions.)

### Precautions when Using Leaded Solder

- Remove all lead free solder from soldered joints when replacing components.
- If leaded solder should be added to existing lead free joints, mix in the leaded solder thoroughly after the lead free solder has been completely melted (do not apply the soldering iron without adding solder).

### When Servicing Soldering Iron

A soldering iron with a temperature setting capability (temperature control function) is recommended.

The melting point of lead free solder is higher than leaded solder. To avoid poor servicing performance, use a soldering iron that maintains a high stable temperature (large heat capacity) and that allows temperature adjustment according to the part being serviced.

### Recommended Soldering Iron

Soldering iron with temperature control function (temperature range: 320~450°C)

Recommended temperature range for each part type:

Part to be Soldered	Soldering Iron Temperature
PCB with surface mount devices	320 ±30°C
PCB without surface mount devices	380 ±30°C
Chassis, metallic shield, etc.	420 ±30°C

### Board Assemblies Using Lead Free Solder:

- **FC4PDP Board** (AVC block)
- **SIGNAL/SOUND Board** (MONITOR block)
- **SP Terminal L/R Board, FILTER Board, LED Board** (MONITOR block)

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## 1. FEATURES

- **852x1024 resolution**, created by 32" ALIS Plasma display panel
- **1024x1024 resolution**, created by 37"/42" ALIS Plasma display panel
- **Advanced progressive & 1024 interlace**, generates detailed picture without flicker
- **TruBass by SRS**, gives real bass sound
- **Thin (9cm) and light**, by separating monitor from tuner box (AVC). It is possible to hang monitor on the wall.
- **Swivel stand attached monitor**, possible to swivel 30deg left and right.
- **3 SCART connectors plus front AV input** can be connected with DVD, Set Top Box, VCR and camera at the same time.
- **1 Component input** allows YP<sub>b</sub>P<sub>r</sub> and PC<sub>b</sub>C<sub>r</sub> to be received. Signal is automatically identified.
- **PC input connection**, supporting various PC display formats.

## 2. GENERAL SPECIFICATION

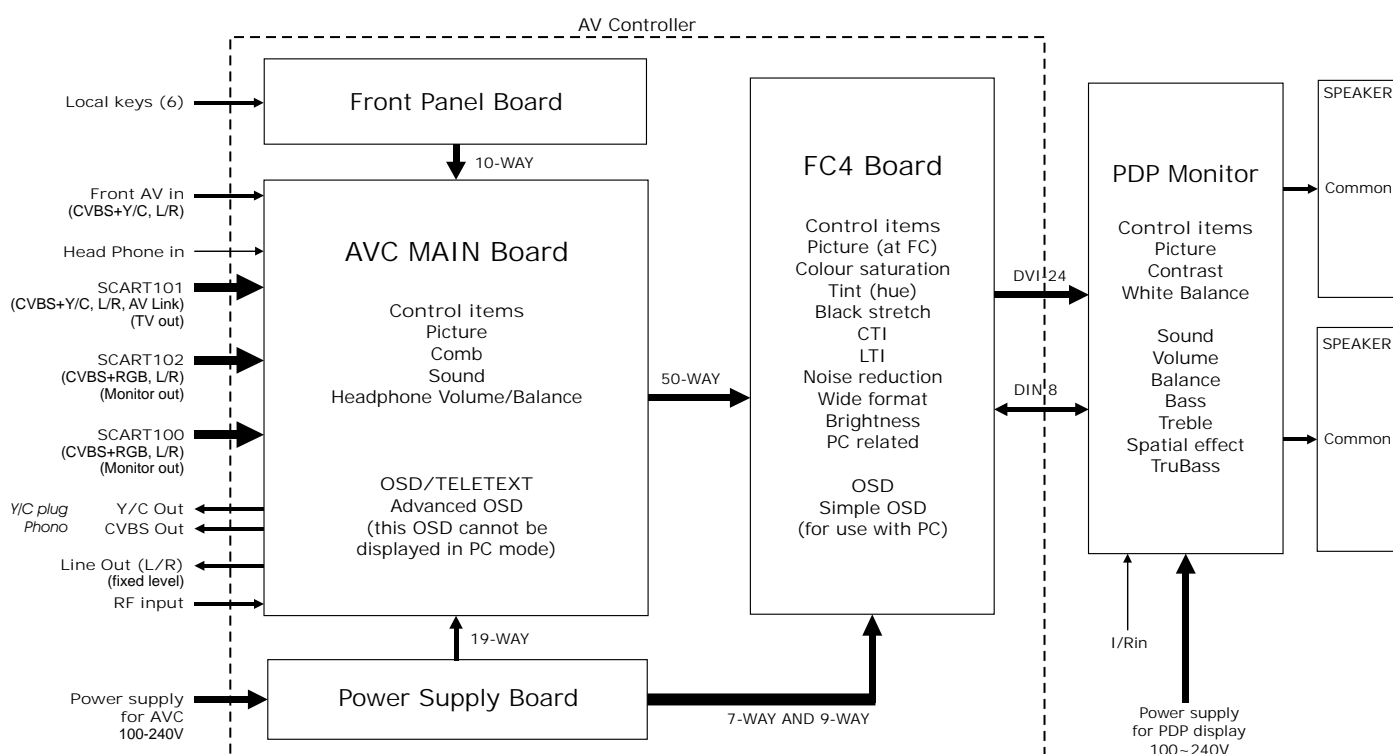
Model	<b>32PD3000</b> (PDP; 32PD3000E + AVC; AV3000E)	<b>42PD3000</b> (PDP; 42PD3000E + AVC; AV3000E)
PDP panel	32" (ALSI for mat) Plasma display panel (16:9), resolution 852(H) x1024 (V)	42" (ALSI for mat) Plasma display panel (16:9), resolution 1024(H) x1024 (V)
Display size	976 (W) x 258 (D) x 580 (H) mm	1233 (W) x 300 (D) x 713 (H) mm
Sound output level	Max. 10W x2 (6W)	Max. 12W x2 (6W)
Speaker	4x 16cm corn type x2	???
Power supply	AC 220~240V 50Hz	AC 220~240V 50Hz
Power consumption	PDP 260W (stand-by <2W) AVC 30W, (stand-by <2W)	PDP 360W (stand-by <2W) AVC 30W, (stand-by <2W)
Colour system	PAL/SECAM/NTSC4.43/NTSC3.58/PAL60	PAL/SECAM/NTSC4.43/NTSC3.58/PAL60
Sound system	I/B.G.H/LL'	I/B.G.H/LL'
Tuning freq.	45~889MHz, VHF low/VHF high/Hyper/UHF	45~889MHz, VHF low/VHF high/Hyper/UHF
Position selection	100 (0~99) positions. Plus channel direct (C--/S--) and frequency direct (---.--MHz)	100 (0~99) positions. Plus channel direct (C--/S--) and frequency direct (---.--MHz)
PC input signal	Horizontal freq 24~109KHz / Vertical freq 50~85Hz. Analogue RGB, input voltage 0.7/1.0 V <sub>p-p</sub> selectable. H/V separate sync (TTL level) *** sound input; common with AV3 or AV4	Horizontal freq 24~109KHz / Vertical freq 50~85Hz. Analogue RGB, input voltage 0.7/1.0 V <sub>p-p</sub> selectable. H/V separate sync (TTL level) *** sound input; common with AV3 or AV4
AV input	SCART101 (CVBS/SVHS/LR sound) - AV1 SCART102 (CVBS/RGB/LR sound) - AV2 SCART100 (CVBS/RGB/LR sound) - AV3 COMPONENT (YPbPr/YCbCr/LR sound) - AV4 Front AV (CVBS/SVHS/LR sound) - FRONT CENTRE AUDIO input	SCART101 (CVBS/SVHS/LR sound) - AV1 SCART102 (CVBS/RGB/LR sound) - AV2 SCART100 (CVBS/RGB/LR sound) - AV3 COMPONENT (YPbPr/YCbCr/LR sound) - AV4 Front AV (CVBS/SVHS/LR sound) - FRONT CENTRE AUDIO input
Dimensions	PDP: 974 (W) x 256 (D) x 578 (H) mm including monitor stand AVC: 430 (W) x 293 (D) x 121 (H) mm	PDP: 1030 (W) x ?? (D) x 636 (H) mm including monitor stand AVC: 430 (W) x 293 (D) x 121 (H) mm
Weight	PDP: 28.7Kg (net) AVC: 3.2Kg (net)	PDP: 40.2Kg (net) AVC: 3.2Kg (net)
Remote	2x Hitachi R6P(G) * equivalent 'AA'	2x Hitachi R6P(G) * equivalent 'AA'

### 3. AV MODES

MODE (sequence)	14/08/2002	PDP Monitor	SCART1 Output	SCART2 Output	SCART3 Output	LINE Output	CVBS/ YC-out
TV	RF Tuner-in	RF	RF	RF	RF	RF	RF
AV1	SCART1 (CVBS/YC-in)	AV1	RF	AV1	AV1	AV1	AV1
AV2	SCART2 (CVBS/RGB-in)	AV2	RF	AV2	AV2	AV2	AV2
AV3	SCART3 (CVBS/RGB-in)	AV3	RF	AV3	AV3	AV3	AV3
AV4	YCbCr/YPbPr	AV4	RF	AV4*	AV4*	AV4*	AV4*
				* TDA9321 the same input as FRONT			
FRONT	FRONT AV (CVBS/YC-in)	FRONT	RF	FRONT	FRONT	FRONT	FRONT
PC	PC (PC in) * sound from AV3 or AV4	PC	RF	FRONT	FRONT	FRONT	FRONT

### 4. AV BOARD DESCRIPTION

#### 4.1. AVC Block Diagram



#### 4.2. Tuner/Video Chroma (Schematic Sheet 1)

VHF/UHF asymmetric type tuner converts RF input signal to IF signal output through pin 11. AGC voltage is supplied at pin 1 from IC100 pin 62. IF output goes through buffer Q101 to SAW filter SAW100 for VIF at pin 2 and 3 of IC100 and to SAW101 for SIF at pin 63 and 64.

CRN	Type	Description	Remarks
TUN100	UV1316/A 1G-3 313914716781	Asymmetric type tuner	Supply voltage: +5V at pin 7 and +33V at pin 9 Control by I <sup>2</sup> C, SDA at pin 5 and SCL at pin 4.
SAW100	K3953M	SAW filter	Picture carrier 33.90MHz, picture to sound carrier distance 6.5MHz for standard L
SAW101	K9456M	SAW filter	Sound carrier 40.40MHz for standard L
IC100	TDA9321H	Video Chroma and Video switch	Supply voltage : +8V at pin 11 and 48 (AS) Control by I <sup>2</sup> C, SDA at pin 47 and SCL at pin 46
TR100	TPWA01B		Nominal centre freq. Fn1=6.0MHz and Fn2=6.5MHz
TR101	TPWA04B		Nominal centre freq. Fn1=5.5MHz and Fn2=5.742MHz
X100		Crystal	3.58MHz
X101		Crystal	4.43MHz

#### 4.2.1. IF Demodulator and Video Chroma

Demodulated video signal is output from pin 10 going to sound traps. There are two sound traps, TR100 for I/L signal and TR101 for BG, outputs from which are switched by SOUND-SWITCH from IC301 pin 5.

After group delay correction at pin 13, it is connected to pin 14 where TV picture is supplied into video switch. The TV signal from pin13 is also connected to SCART1 as TV signal output.

Quasi Split Sound converted from SIF input is output at pin 5 to connect with sound decoder IC301. H and V sync pulses are output at pin 60 and 61 to go to FC/MSD for Synchronisation to convert progressive scan. H pulse must be inverted by Q126.

When selecting one of video signal in video switch of IC100, CVBS signal is going to COMB filter if the video is CVBS PAL/NTSC format. Then Y/C separated signal is coming back at pin 28 and 29. The clock must be provided from pin 30. The video or Y/C signal selected pass through video chroma section and finally converted to YUV format at pin 49, 50, 51. IC100 is supplied 4.43MHz and 3.58MHz clock from crystal X100 and X101, which is automatically selected according to the signal received. 2 RGB inputs are also switched at the last stage in IC100. RGB signals are also converted to YUV. Video Switch.

Pin No.		Description
14	Input	TV signal input
16	Input	CVBS - SCT100-TOP (AV2) input
18	Input	CVBS - SCT100-BOTTOM (AV3) input
20	Input	CVBS/Y - SCT101 (AV1) input
21	Input	C - SCT101 (AV1) input
23	Input	CVBS/Y - front AV (FRONT) input
24	Input	C - front AV (FRONT) input
28	Input	Y - from COMB filter
29	Input	C - from COMB filter
15	Input	SCT100-TOP (AV2) pin 8 detection
17	Control	SCT100-BOTTOM (AV3) pin 8 detection
-	Control	SCT101 (AV1) pin 8 detection is done by micro IC704 pin 28
26	Output	Go to COMB filter and phono video output
32	Output	Go to micro for TELETEXT decoding
34	Output	Go to SCT100-TOP (AV2) and SCT100-BOTTOM (AV3) as monitor video output
20	Output	L/L' switch for SAW filter in/out at SAW101
22	Control	Micro sw to switch SVHS or CVBS for front AV input

### 4.3. **Sound/AV3 Control (Schematic Sheet 2)**

#### 4.3.1. **NICAM/A2 Decoder and Sound Control**

QSS signal is coming from IC100 to pin 58 through amplifier Q308/Q307. The signal level at pin 58 should be  $0.1 \sim 0.8V_{p-p}$ .

Sound output L/R at pin 28 and 29 are connected through amplifier Q310/Q312 for L and Q309/Q311 for R to adjust 500mVrms at PL700 pin 4 and 6 in the condition of AV sound input 500mVrms, FM modulation 54%.

Sound output L/R at pin 28 and 29 are also connected through IC300 TDA7433 and IC303 to headphone. Monitor sound L/R outputs for speaker are connected headphone and phone out. IC300 contributes separate volume control.

Headphone sound L/R controlled its level by IC300 are amplified.



CRN	Type	Description	Remarks
IC301	MSP3410	NICAM/A2 sound decoder and audio switch	Supply voltage: +5V at pin 18 and pin 51 Control by I <sup>2</sup> C, SDA at pin 10 and SCL at pin 9
X300		Crystal	18.432MHz
IC300	TDA7433	Basic audio processor	Supply voltage: +8V at pin 17 Control by I <sup>2</sup> C, SDA at pin 19 and SCL at pin 18
IC303	TDA2822D	Headphone sound amplifier	Supply voltage: +6.5V at pin 2
PL300		Connector for front control PCB	
IC302 (OPTION)	TDA8440		Future option. Not used for this model.

#### 4.3.2. Audio Switch

Pin No.	Description
52 Input	SCT101 (AV1) sound L input
53 Input	SCT101 (AV1) sound R input
49 Input	SCT100-TOP (AV2) sound L input
50 Input	SCT100-TOP (AV2) sound R input
46 Input	SCT100-BOTTOM (AV3) sound L input
47 Input	SCT100-BOTTOM (AV3) sound R input
43 Input	front AV (FRONT) sound L input
44 Input	front AV (FRONT) sound R input
55 Input	mono sound input from IC100
37 Output	SCT101 (AV1) sound L output
36 Output	SCT101 (AV1) sound R output
34 Output	SCT100-TOP (AV2) / SCART3 (AV3) sound L output
33 Output	SCT100-TOP (AV2) / SCART3 (AV3) sound R output
29 Output	Speaker / Headphone/phone sound L output
28 Output	Speaker / Headphone/phone sound R output
5 Output Control	SOUND SWITCH for trap of TV input signal

#### 4.3.3. TDA7433

Basic Audio Processor (IC300)

Pin No.		Description
6	Input	Audio sound L input
5	Input	Audio sound R input
16	Output	Phono sound L output
15	Output	Phono sound R output
14	Output	Headphone sound L output
13	Output	Headphone sound R output

#### 4.3.4. Front AV Video Switch

PL300 is the connector for the front control PCB.

At pin 12 of PL700, CVBS from AV3 is connected.

At pin 11 of PL700, Y from AV3SVHS is connected.

At pin 9 indication of SVHS connector insertion is supplied to micro IC704 pin 38 and then it controls micro-sw from pin 22 of IC100 in order to select Y from pin 11 of PL700 (micro-sw=H) or to select CVBS from pin 12 of PL700 (micro-sw=L).

At pin 15 of PL700, C from AV3SVHS is connected to pin 24 of IC100.

#### 4.4. **Interface Board (Schematic Sheet 3)**

For Component Input, Progressive Sync Separation and Centre Audio Channel.

Sync separation for progressive YPbPr input (50Hz and 60Hz) are carried out at TA1370. Input video signal is specifically given from AV4 and connected at pin 26 through clamping circuit constituted by QC25~QC28. Sync separation for all input signal other than Progressive input are carried out at TDA9321 (page 1). TA1370 includes switch of sync signal (H and V) between H/V input (pin 1 and pin 2) from TDA9321 and internal sync separation. TA1370 outputs H at pin 16 and V at pin 28, which are connected to PSF for FC4 board. There are 2 inputs of the connector for each main and sub. H output at pin 16 on TA1370 is fed to IC10 to shorten H pulse waveform to avoid jittering.

2 inputs, main YUV from IC03 and RGB from micro (TELETEXT), are switched and connected to sub-video input for FC4 (IC107). This is enabled when TV+TEXT is selected (SUB TELETEXT) and when PC window is selected (SUB VIDEO)

CRN	Type	Description	Remarks
IC08	TA1370	Sync separation for Component (progressive) input	Supply voltage: +9V at pin 11 Control by I <sup>2</sup> C, SDA at pin 21 and SCL at pin 22
XC01		Crystal	50KHz
IC02/IC03	TA1287	YUV/RGB switch	Supply voltage: +9V at pin 16 Control by DC voltage at pins 9/10/11 and matrix at pin 16
IC04	BU4066	Analogue switch	Audio switch, main L/R or AV4 (components input) L/R. main L/R comes from MSP3410 audio switch
IC05			Video switch, Front video or AV4 (in case of YCbCr normal components), which is connected to TDA9321 for sync separation
IC06			Audio switch, Centre sound or AV4 (components input) L/R. Output goes to IC04 to switch another audio input
IC07	BU4053	Analogue Switch for Sub-video	Supply voltage: +9V at pin 16
IC09	M62320FP	I/O expanders	Supply voltage: +5V at pin 13 Control by I <sup>2</sup> C, SDA at pin 3 and SCL at pin 2

#### 4.4.1. TA1287

##### YUV/RGB switch (IC02/IC03)

	CRN	Remarks
Input:	IC02	YUV: Main signal
	IC03	YUV: from IC02
		YUV: at pin 1/2/3, Y:1 V <sub>p-p</sub> (incl. sync), UV:0.3Vp-p
		RGB: at pin 6/7/8, 0.7Vp-p
Output:	IC02	Connect to IC03
	IC03	Connect to FC4 through buffers
		YUV: at pin13/14/15, Y:1 V <sub>p-p</sub> (incl. sync), UV:0.3Vp-p
Matrix control of RGB input:	IC02	0V: through
	IC03	Always 1.6V:RGB > YUV
(YUV can also input. In this case, matrix control should be through)		
Control:	IC02	0V: external (Components input)
	IC03	0V: Video

#### 4.4.2. M62320FP

I/O expanders (IC09)

Pin No.	Pin Name	Description	Connect to	L	H
4	D00	Component video	IC02, IC05	Components input	Other than components
5	D01	Matrix	IC02	RGB --> YUV	Through
6	D02	PC	IC07	Not PC mode (SUB TEXT)	PC mode (SUB video in PCW)
7	D03	OSD-blank	IC03	Kill OSD	OSD enabled
9	D04	Cinema	IC06, IC04	Audio centre not selected	Audio centre selected
10	D05	Clamp-source	IC05	CP from TA1370	SC from TDA9321
11	D06	TV/TEXT	IC03	TEXT (select RGB input)	TV
12	D07	N.C.			

#### 4.5. Power Circuit/Level Shifter (Schematic Sheet 4)

Power Supply Connector PSP from Power Supply board:

Pin No.	Pin Name	Remarks
1	POWER1	Power ON/Stand-by control H: ON, L: Stand-by
2,3,4	N.C.	
5	+5VSTB	Stand-by 5V for micro controller circuit
6	GND	
7,8	N.C.	
9	GND	
10	GND	
11	+5.5V1	5.5V supply 1
12	GND	
13	+9.5V1	9.5V supply 1
14	GND	
15	+5.5V2	5.5V supply 2
16	GND	
17	+9.5V2	9.5V supply2
18	GND	
19	FE+30V	30V supply for tuner

#### 4.5.1. Voltage Regulators

CRN	Type	Remarks
I603	BA06T	Input +9.5V2 - Output +8V For video chroma circuit (page 1)
IC602	SI-3050LSA	Input +5.5V1 - Output +5VFE For tuner (page 1)
IC603	SI-3050LSA	Input +5.5V2 - Output +5V For audio processor circuit (page 2), comb filter (page 6)
IC601	SI-3033LSA	Input +5VSTB - Output 3.3VSTB For micro-controller circuit
Q602	TK11125M	Input +5VSTB - Output 2.5VSTB For micro-controller circuit
IC604	BA09FP	Input +9.5V1 - Output +9V For interface circuit (Sheet 3)

#### 4.5.2. Level Shift for Control Buses

CRN	Type	Remarks
Q607	BSS138	3WB-DATA to change from 3V3 to 5V
Q603	2SC2412K	3WB-CLOCK to invert with 5V range
Q604	2SC2412K	FC-ENABLE to invert with 5V range
Q605	2SC2412K	MSC-ENABLE to invert with 5V range
Q614	BSS138	1900TX to change from 3V3 to 5V

#### 4.6. **Micro-controller (Schematic Sheet 5)**

SCL3v3 and SDA3v3 are converted for 5V operation in Q700, Q701, Q705 & Q706. OSD/TEXT RGB at pin 58/59/60 are synchronised with progressive sync pulses 2H (32KHz) at pin 32 and V (50/60Hz) at pin 33. RGB and BLK are also converted to 5V operation at Q713, Q714, Q715 and IC707. AV link is bi-directional bus from pin 10 of SCT101 made by Q709/D701~D703. For the micro, input and output are separated. The signal level is also converted between 3V3 in micro and 5V for SCART.

See 'Micro-controller Pinout' in the PINOUT DATA section of this manual for microcontroller pin functions. (IC701B Option not fitted.)

CRN	Type	Description	Remarks
IC704	SDA5550	Micro-controller	See below
X700		Crystal	6MHz
IC700	M24C16W	EEPROM (16k-bits)	Supply voltage: +3.3VSTB at pin 8 Control by I <sup>2</sup> C: SDA3v3 at pin 5 and SCL3v3 at pin 6 and WC3v3 at pin 7
IC701	AT49LV002N	Flash memory (256Kbytes) for software stored	Supply voltage: +3.3VSTB at pin 32 Control by address and data buses
IC703	K6T1008V2E-GB70000 or equivalent	SRAM, SMT (128kbytes)	Supply voltage: +3.3VSTB at pin 32 Control by address and data buses
IC705	M62703SL/ML	Reset IC for IC704	Supply voltage: +3.3VSTB at pin 1

#### 4.6.1. SDA5550

Micro-controller (IC704)

Supply voltage: +3.3VSTB at pin 8, 40, 75 and 92 and +2.5VSTB at pin 6, 22, 56 and 73.

Control through I<sup>2</sup>C: SDA3v3 at pin 52 and SCL3v3 at pin 47.

3 wire bus: 3WB-clock3v3 at pin 41 and 3WB-data3v3 at pin 46:

- FC-enable at pin 42
- MSC-enable at pin 43
- OSD enable at pin 44

Control through/by AVlink: output at pin 16 and input at pin 33.

RS232C (19200bps): TxD3v3 at pin 32 and RxD3v3 at pin 38.

Control by I/R in: at pin 34.

#### 4.6.2. Front Panel Board Connector

##### PL702

Pin No.	Pin Name	In/Out	Functions
1	POW LED	I	Power LED
2	POWER SAVE	I	POWER2
3	STB+5V	I	Stand-by 5V power supply
4	GND	-	GND
5	RM-IN	O	N.C.
6	A+5V	I	+5V
7	A/D KEY 2	O	Key in 1
8	A/D KEY 1	O	Key in 2
9	(BS-LED)	-	N.C.
10	(MODEM-LED)	-	At Front Control N.C.

#### 4.7. COMB Filter/SVHS Output (Schematic Sheet 6)

CVBS from IC100 pin 26 is filtered by C800, C801, L800, and C802 and connected to pin 3.

Y/C separate signals output from IC101 pin 25/23 are also filtered by Q801 base circuit and Q802 base circuit.

- Y is amplified to adjust the level at Q119/Q120 for return signal to IC100 and SVHS. Y signal output via buffer Q803.
- C is amplified to adjust the level at Q121/Q122 for return signal to IC100 and SVHS. C signal output via buffer Q804.

IC101 requires clock at pin 19 supplied from IC100.

##### 4.7.1. TC9090AF

COMB filter (IC101)

Supply voltage: +5V at pin 15, 18 and 27.

Control by I<sup>2</sup>C: SDA at pin 8 and SCL at pin 9.

#### 4.7.2. SVHS Output Connector

##### SVHS100

Pin No.	Functions	Pin No.	Functions
1,2	GND	4	Y
3	C	5	GND (SW)

#### 4.8. SCART/FC-MSC Connection (Schematic Sheet 7)

##### 4.8.1. SCART Connectors

Pin No.	AV1 SCT101	AV2 SCT100-TOP	AV3 SCT100-BOTTOM	General Specification
1	Sound o/p R	Sound o/p R	Sound o/p R	Audio output R: $\leq 1K\Omega$ , nominal 0.5Vrms $\pm 3dB$ , max 2Vrms: 54% modulation in FM/AM
2	Sound i/p R	Sound i/p R	Sound input R	Audio input R: $\geq 10K\Omega$ , nominal 0.5Vrms, min.0.2Vrms, max 2Vrms
3	Sound o/p L	Sound o/p L	Sound o/p L	Audio output L: $\leq 1K\Omega$ , nominal 0.5Vrms $\pm 3dB$ , max 2Vrms: 54% modulation in FM/AM
4	GND	GND	GND	Audio common return
5	GND	GND	GND	Blue return
6	Sound i/p L	Sound i/p L	Sound i/p L	Audio input L: $\geq 10K\Omega$ , nominal 0.5Vrms, min.0.2Vrms, max 2Vrms
7	N.C.	Blue-in	Blue-in	Blue: $75\Omega$ , $0.7 \pm 0.1V$
8	Switch	Switch	Switch	Function switch: $\geq 10K\Omega$ , $\leq 2nF$ , Level 0: 0~2V, Level 1A: +4.5~7V (16:9), Level 1B: +9.5~12V (4:3)
9	GND	GND	GND	Green return
10	AVLINK	N.C.	N.C.	AVlink: TTL level
11	N.C.	Green-in	Green-in	Green: $75\Omega$ , $0.7 \pm 0.1V$
12	N.C.	N.C.	N.C.	Under consideration
13	GND	GND	GND	Red return
14	GND	GND	GND	Blanking return
15	C in	Red-in	Red-in	Red/C: $75\Omega$ , $0.7 \pm 0.1V$ (Red), $\pm 3dB$ at 1 $V_{p-p}$ Y signal (C)
16	N.C.	Fast Blanking	Fast Blanking	Blanking: $75\Omega$ , logical 0 (off): 0~0.4V, logical 1: +1~3V
17	GND	GND	GND	Video output return
18	GND	GND	GND	Video input return
19	TV output	Monitor o/p	Monitor output	Video/Y output: $75\Omega$ , 1 $V_{p-p} \pm 3dB$ (sync 0.3V -3dB +10dB)
20	CVBS/Y in	CVBS in	CVBS in	Video input: $75\Omega$ , 1 $V_{p-p} \pm 3dB$ (sync 0.3V -3dB +10dB)
21	GND	GND	GND	Common return and contact 8, 10, 12

#### 4.8.2. 26-way Connector

Connection with FC/MSB Board (PL700).

Assuming that 1 V<sub>p-p</sub> video signal with 75 ohm terminated is input through SCT100-BOTTOM (AV3):

- UV are inverted by Q609, Q612, Q610 & Q613 to CbCr (U'V') at pin 25/24 and those are adjusted to the level at 1.4Vp-p
- Y is amplified by Q608/Q611 to adjust the level at 1.4V for signal and 0.6V for sync (2V<sub>p-p</sub> in total) at pin 26

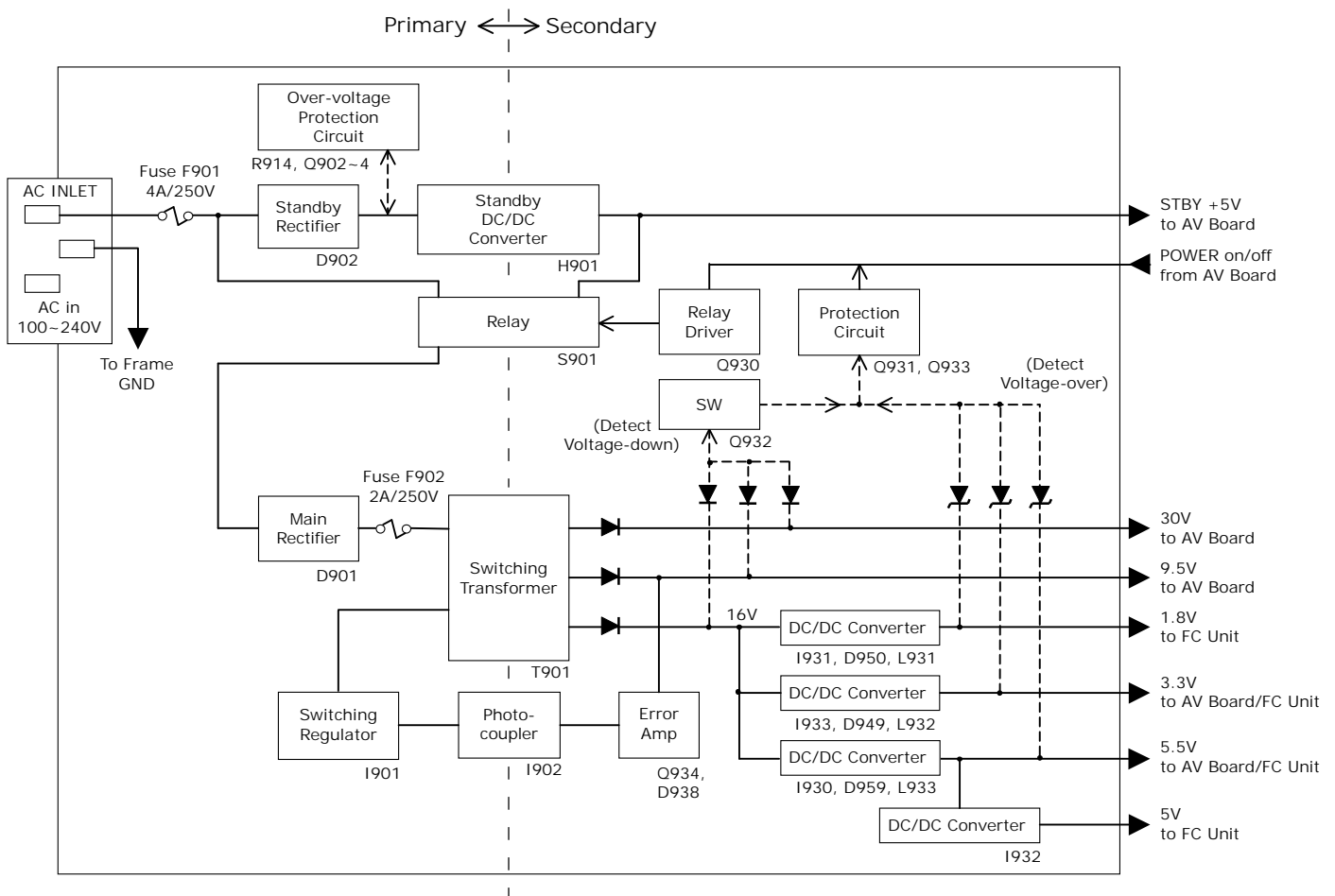
Sound level L and R at pins 6/4 should be 500mVrms on the condition that:

- 500mVrms audio is input through SCT100-BOTTOM (AV3)
- BG FM sound with 54% modulation is received

Connection with FC/MSB Board (PL701).

## 5. AVC POWER BOARD DESCRIPTION

### 5.1. AVC Power Board Block Diagram



### 5.2. Switching Regulator, Controller and Power MOS FET

STR-F6668B (I901).

Supply voltage at pin 4:

- Over +16V (start operating),
- over +10V (keep operating).



Pin No.	Description
1	Feedback input
2	Source of power MOS FET
3	Drain of power MOS FET
4	Power supply input for controller
5	GND

### 5.3. **DC+5V Switching Regulator Module**

uPM0518SA (H901).

Supply voltage: DC +120~375V at pin 1.

Pin No.	Description
Inputs	1 DC (+) voltage input
	5 DC (-) voltage input
	7 Feedback input 1
	8 Feedback input 2
Outputs	6 DC (-) voltage output
	9 DC (+) voltage output

### 5.4. **Photo-coupler**

TLP621 (I902).

### 5.5. **Switching Regulators**

SPI-8010A (I930).

Supply voltage: DC +8.5~50V at pin 11.

Pin No.	Description
Inputs	11 DC voltage input
	15 Feedback input
Output	7 Switching output

SI-8010GL (I931).

Supply voltage: DC +8~50V at pin 5.

Pin No.	Description
Inputs	5 DC voltage input
	8 Feedback input
	2 Output ON/OFF
Output	4 Switching output

SI-8033JD (I933).

Supply voltage: DC +5.3~40V at pin 1.

Pin No.		Description
Inputs	1	DC voltage input
	4	Feedback input
	5	Output ON/OFF
Output	2	Switching output

### 5.6. **DC+5V Series Regulator**

SI-3050LSA (I932).

Supply voltage: DC +5.1~8V at pin 1 & 3.

Pin No.		Description
Inputs	1	DC voltage input
	3	DC voltage input
Outputs	7	DC +5V output
	8	DC +5V output

### 5.7. **Connectors**

PSP connector for AV Board.

PFP1 connector for FC4 unit.

PFP2 connector for FC4 unit.

### 6.1. FC4 Board Block Diagram



## 7. PINOUT DATA

### 7.1. *Micro-controller Pinout (SDA5550)*

Digital Monolithic IC (IC704)

**Note \*:**

Power key input:

ON	Stand-by	Power Save
H(1.5V)	L	H(1.2V)
H(1.0V)	L	L
H(1.5V)	H(1.5V)	H(1.5V)

Pin No.	Port No.	Function	Inverted (I) or Buffered (B) Function	In/Out	Notes
9	Port0	0.0	POWER-ON	IN	Power key input *
10		0.1	POWER1	OUT	Power control 1
11		0.2	POWER2	OUT	Power control 2
12		0.3	(I) POWER-LED5V	OUT	Power LED control
13		0.4	(I) OSD-RESET	OUT	PC OSD reset
14		0.5	(I) PM-RESET	OUT	PDP reset
15		0.6	WC#EEPROM	OUT	EEPROM enable
16		0.7	AV-LINK-OUT	OUT	AV link output
41	Port1	1.0	3WB-CLOCK	OUT	3 wire bus clock
42		1.1	FC-ENABLE	OUT	FC enable
43		1.2	MSC-ENABLE	OUT	MSC enable
44		1.3	(I) OSD-EN	OUT	PC OSD enable
45		1.4	(I) MSP-RESET	OUT	MSP3410 reset
46		1.5	3WB-DATA	IN/OUT	3 wire buses data
47		1.6	SCL-3V3	OUT	I2C bus clock
52		1.7	SDA-3V3	IN/OUT	I2C bus data
24	Port2	2.0	ADC0	IN	Scart 101 (AV1) pin8 detect
25		2.1	ADC1	IN	AGC level detect
26		2.2	PDDDET	IN	PDP ON detect
27		2.3	ADC3	IN	Vol&Prog. key input

31	Port3	3.0	IF TRAP	ADJACENT CHANNELS	OUT	Not used
32		3.1	1900TX-3v3		OUT	PDP communication via RS232C
33		3.2	SCI	FROM AVLINK	IN	AV link input
34		3.3	IR1	IR FROM PDP	IN	IR input
35		3.4	FRONT-SVHS-SOCKET		IN	S-VHS socket detect
36		3.5	MAP1	A18 ON SRAM	OUT	SRAM mapping
37		3.6	MAP2	A15/A18 SWITCH	OUT	SRAM mapping
38		3.7	1900RX		IN	PDP communication via RS232C
48	Port4	4.2	MEM RD#		OUT	SRAM output enable
49		4.3	MEM WR#		OUT	SRAM write enable

## 7.2. AVC-PDP Connectors

### 7.2.1. DVI74320-4004

24-way Digital Interface Cable Connector (P301P)

PIN No:	AVC (FC4)		PDP	PIN No:	AVC (FC4)		PDP
1	TX2-	>	TX2-	13	N.C.	-	N.C.
2	TX2+	>	TX2+	14	+5VAVDET	>	+5VAVDET
3	SHIELD	-	SHIELD	15	GND	-	GND
4	N.C.	-	N.C.	16	HPDET	>	HPDET
5	N.C.	-	N.C.	17	TXD-	>	TXD-
6	SCLH	>	SCLH	18	TXD+	>	TXD+
7	SDAH	>	SDAH	19	SHIELD	-	SHIELD
8	N.C.	-	N.C.	20	N.C.	-	N.C.
9	TX1-	>	TX1-	21	N.C.	-	N.C.
10	TX1+	>	TX1+	22	SHIELD	-	SHIELD
11	SHIELD	-	SHIELD	23	TXC+	>	TXC+
12	N.C.	-	N.C.	24	TXC-	>	TXC-

### 7.2.2. TC57587-01-401

8-way Digital Interface Cable Connector (P302P)

PIN No:	AVC (FC4)		PDP
1	TXD	>	TXD
2	RXD	<	RXD
3	PARITY	>	PARITY
4	REMO-PDP	<	REMO-PDP
5	AUDIO L	>	AUDIO L
6	AUDIO R	>	AUDIO R
7	PDDDET	<	PDDDET
8	AVDET2	>	AVDET2

### 7.3. FC4 Connectors

#### 7.3.1. FPC Connector

FH12-50S-0.5SV 0.5mm pitch (PSF)

Pin No.	AVC PSF Pin Name	FC4 P001 Pin Name	In/ Out	Function	Notes
1	GND	GND	I/O	I <sup>2</sup> C bus DATA	
2	N.C.	N.C.	I/O	I <sup>2</sup> C bus CLOCK	
3	GND	GND	-	GND	
4	DATA	DATA	I/O	3-wire DATA	5V CMOS
5	CLK	CLK	I	3-wire CLOCK	5V CMOS
6	GND	GND	-	GND	
7	FC-ENA	FC-ENA	I	FC micro enable	5V CMOS
8	MSC-ENA	OSD-CS	I	MSC micro enable	5V CMOS
9	DATA	OSD-DATA	I	3-wire DATA	5V CMOS
10	CLK	OSD-CLK	I	3-wire CLOCK	5V CMOS
11	GND	GND	-	GND	
12	N.C.	N.C.(2H)	O	2H sync for OSD	
13	N.C.	K_DET	I	Enable for OSD generator	
14	N.C.	N.C.(2V)	O	2V sync for OSD	
15	N.C.	KMASK	I	RESET for OSD generator	
16	GND	GND	-	GND	

17	RS232C-PDP(TxD)	32C-PDP (TXD)	I	RS232C-TxD	5V CMOS
18	RS232C-PDP(RxD)	32C-PDP (RXD)	O	RS232C-RxD	5V CMOS
19	GND	GND	-	GND	
20	+5VSTB	AVDET	I	PDP control	
21	N.C.	N.C.	I	MATRIX control	
22	Remo-PDP	Remo-PDP	O	R/C command from PDP	5V CMOS
23	GND	N.C.	-	GND	
24	PM RST	PM RST	I	PDP control	5V CMOS
25	PD DET	PD DET	O	PDP control	5V CMOS
26	GND	GND	-	GND	
27	MY	MY	I	Video Y	1.4V±0.06Vp-p
28	MCb	MCb	I	Video Cb	0.7v±0.03Vp-p
29	MCr	MCr	I	Video Cr	0.7v±0.03Vp-p
30	GND	GND	-	GND	
31	MH	MH	I	Main H sync	5V CMOS
32	MV	MV	I	Main V sync	5V CMOS
33	GND	GND	-	GND	
34	SY	SY	I	Sub Y/G	1.4 ±0.06Vp-p (Y) / 0.7 ±0.03Vp-p (G)
35	SCb	SCb	I	Sub Cb/B	0.7 ±0.03Vp-p
36	SCr	SCr	I	Sub Cr/R	0.7 ±0.03Vp-p
37	GND	GND	-	GND	
38	SH	SH	I	Sub H sync	5V CMOS
39	SV	SV	I	Sub V sync	5V CMOS
40	GND	GND	-	GND	
41	GND	GND (OSD/TXT G)	I	GND	
42	GND	GND (OSD/TXT B)	I	GND	
43	GND	GND (OSD/TXT R)	I	GND	
44	GND	GND (OSD BLK/Ys)	I	GND	
45	GND	GND (OSD/Ym)	I	GND	
46	GND	GND	-	GND	
47	AUDIO L	AUDIO L	I	Audio L	Typ 500mVrms
48	GND	GND	-	GND	
49	AUDIO R	AUDIO R	I	Audio R	Typ 500mVrms
50	GND	GND	-	GND	

### 7.3.2. 7-P Connector

Base SM3 1.5mm Pitch (PFP1)

Pin No.	FC4 P002P Pin Name	In/Out	Function	Notes
1	FA+6.0V	I	6V power supply	460mA
2	FA+6.0V	I	6V power supply	
3	GND	-	GND	
4	GND	-	GND	
5	FSTB+5V	I	Stand-by +5V	50mA
6	FSTB+5V	I	Stand-by +5V	
7	GND	-	GND	

### 7.3.3. 9-P Connector

Base SM3 1.5mm Pitch (PFP2)

Pin No.	FC4 P003P Pin Name	In/Out	Function	Notes
1	D+1.8V	I	1.8V power supply	500mA
2	D+1.8V	I	1.8V power supply	
3	GND	-	GND	
4	GND	-	GND	
5	D+3.3V	I	3.3V power supply	350mA
6	D+3.3V	I	3.3V power supply	
7	D+3.3V	I	3.3V power supply	
8	GND	-	GND	
9	GND	-	GND	

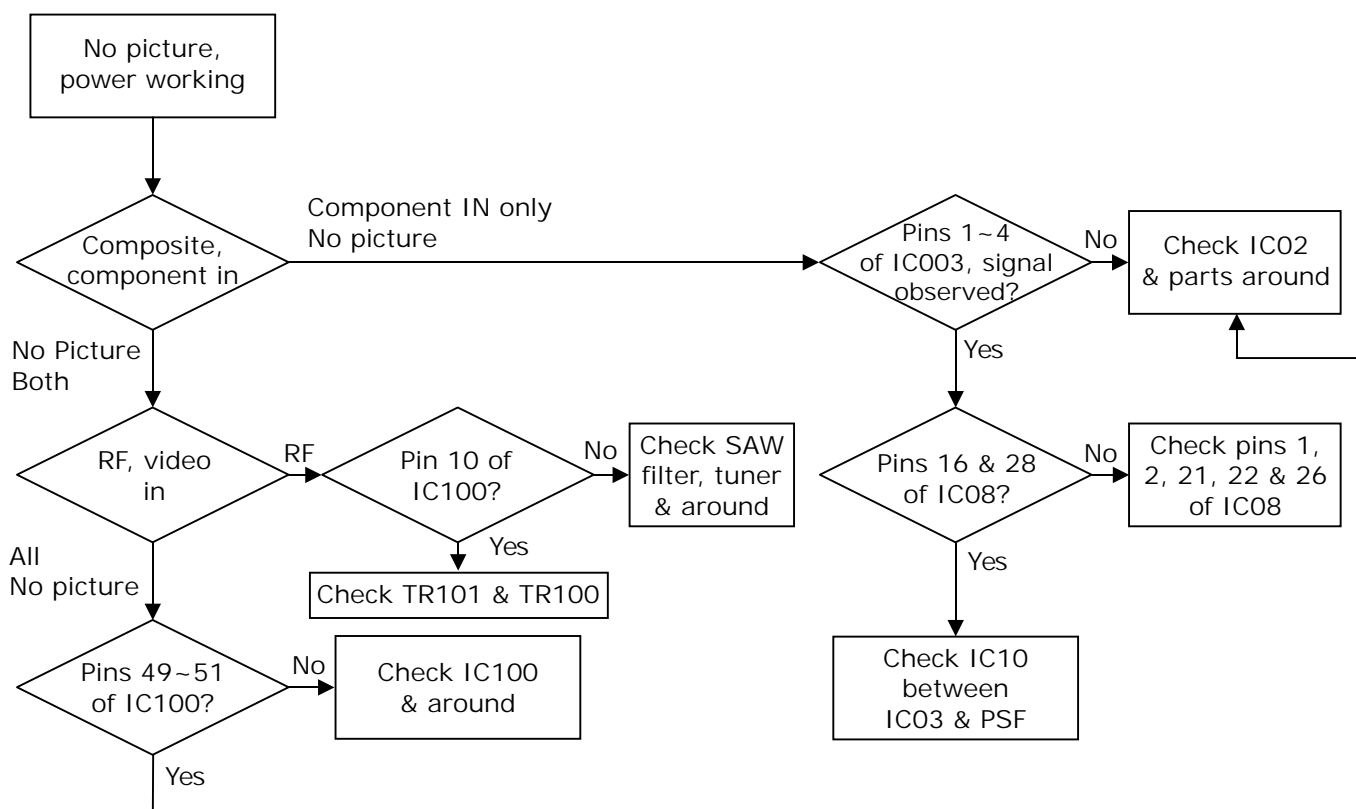


## 8. SERVICING INFORMATION

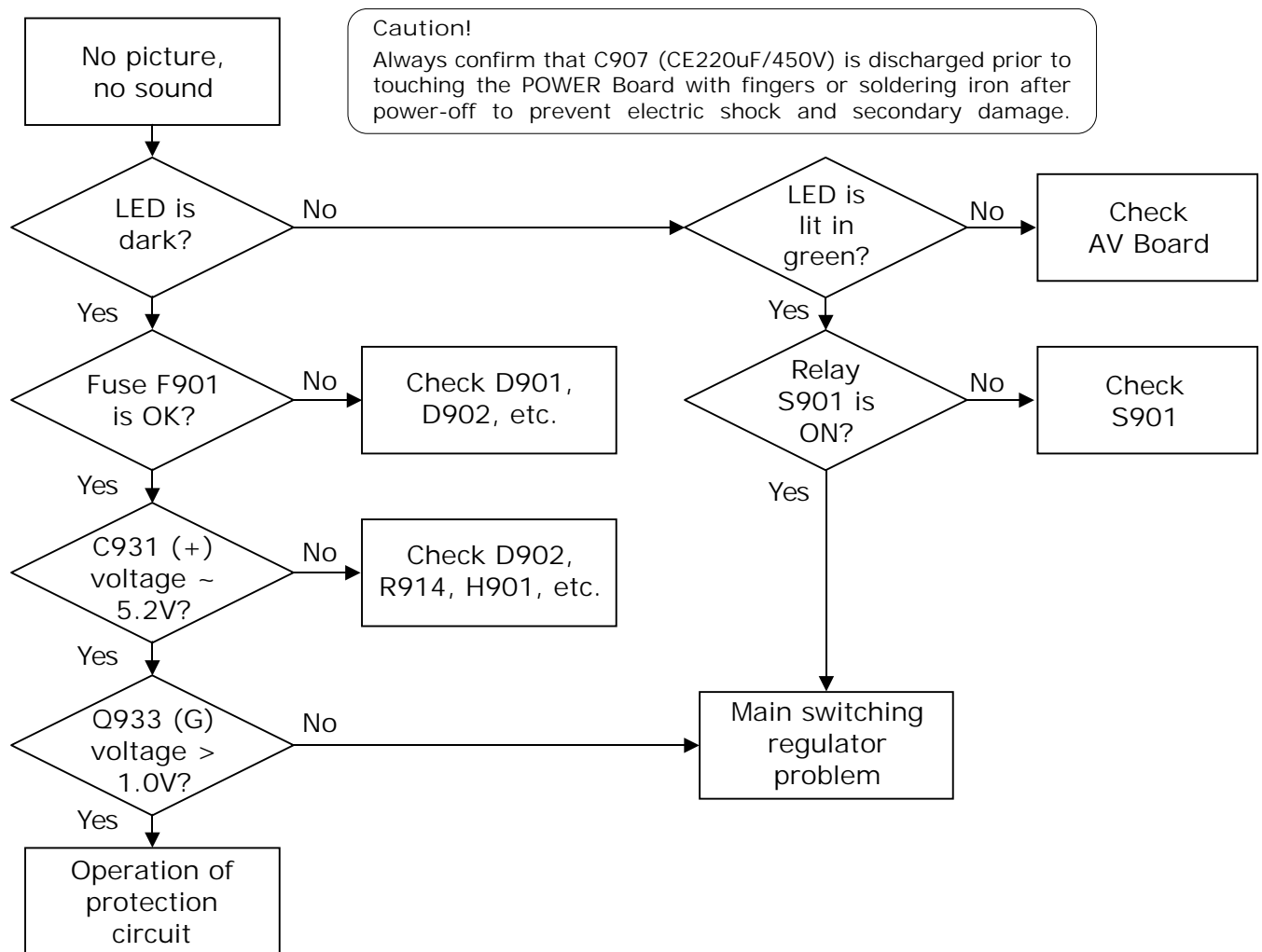
### 8.1. Diagnostics

Phenomenon	Check Point	Potential Problem
PDP LED is flashing	50-way cable between AVC and FC4?	Cable disconnected
	Digital interface cable DVI24 or DIN8 disconnected?	Cable disconnected
No picture	See "AV Board Troubleshooting"	
Picture unstable	Crystal oscillates?	Dry joint/solder bridge X100/C135/X101/C136
	Comb filter works?	Component dry joint/solder bridge/broken in CHROMA lines, e.g. R208/Q121/Q122
		Components of comb clock IC101 pin 19
Noisy picture on RF (TV)	VIF inputs around pins 1~4 of IC100 input proper signal?	Dry joint/solder bridge at pins 1~4 or broke device of IC100
No sound	Slow response toward R/C handset	R319 disconnected
	IC301 pins 58/59 input proper signal (0.1~0.8Vp-p)	F-sound-out line component failure
No WSS response and no TELETEXT	IC100 pin 32 signal observed?	Pin 32 solder bridge (to pin 31)/dry joint or in line of CVBS-micro

### 8.2. AV Board Troubleshooting



### 8.3. Power Board Troubleshooting



## 8.4. Service Menu Data

**CYAN** background means to separate data for each 32/37/42".

**RED** figures are new default values.

1st	2nd	3rd	4th	5th	32" Values HEX	37" Values HEX	42" Values HEX	Functions			
SVC> (*1)	TUN>	ADC			READ	READ	READ	AGC data			
		OPT			80	80	80	Option for destination			
		AGC			ADJ	ADJ	ADJ	AGC adjustment			
		BIF			ADJ	ADJ	ADJ	AFC adjustment for all except L'			
		LIF			ADJ	ADJ	ADJ	AFC adjustment for L'			
		AFC			READ	READ	READ	AFC level indication			
	PC >	PC1 >	GSW		01	01	01	Gamma switch	PDP	10	D3:D2
			BLP		7F	7F	7F	Black Level RGB; user brightness control for PC	FC4	5	D07:D00
			COP		7F	7F	7F	Contrast (RGB)	FC4	6	D07:D00
		PC2>	MBC		7F	7F	7F	Main brightness centre	FC4	7	D15:D08
			MCC		5D	5D	5D	Main contrast centre	FC4	7	D07:D00
			MXB		6C	6C	6C	Brightness Max. for wide NORMAL/REAL	FC4	7	D15:D08
			BGP		00	00	00	Brightness/Gradation	PDP	27&28	D2&D2
			CCP		00	00	00	NTSC/EBU	PDP	27&28	D1&D1
			DCP		01	01	01	Tracking correction	PDP	27&28	D0&D0
		PC3>	PSE		01	01	01	PC power save enable/disable	FC4	4	D08

			<b>PST</b>		0F	0F	0F	Power save timer			
	<b>SIG&gt;</b>	<b>FLA</b>			OK	OK	OK	CAUTION!! Never press OK unless proper signal is displayed, auto signal level adjustment activates.			
		<b>MAX</b>			READ	READ	READ	Max signal level on screen			
		<b>MIN</b>			READ	READ	READ	Min signal level on screen			
		<b>SNR</b>			READ	READ	READ	FC noise level indication			
	<b>MIS&gt;</b>	<b>RGB&gt;</b>	<b>COL&gt;</b>	<b>R1</b>	READ	READ	READ	Gain R; warm	PDP Read/Write	13/20	1st D7:D0 / D7:D0
				<b>G1</b>	READ	READ	READ	Gain G; warm	PDP Read/Write	13/21	2nd D7:D0 / D7:D0
				<b>B1</b>	READ	READ	READ	Gain B; warm	PDP Read/Write	13/22	3rd D7:D0 / D7:D0
			<b>NOM&gt;</b>	<b>R2</b>	READ	READ	READ	Gain R; normal	PDP Read/Write	12/17	1st D7:D0 / D7:D0
				<b>G2</b>	READ	READ	READ	Gain G; normal	PDP Read/Write	12/18	2nd D7:D0 / D7:D0
				<b>B2</b>	READ	READ	READ	Gain B; normal	PDP Read/Write	12/19	3rd D7:D0 / D7:D0
			<b>WAM&gt;</b>	<b>R3</b>	READ	READ	READ	Gain R; cool	PDP Read/Write	11/14	1st D7:D0 / D7:D0
				<b>G3</b>	READ	READ	READ	Gain G; cool	PDP Read/Write	11/15	2nd D7:D0 / D7:D0
				<b>B3</b>	READ	READ	READ	Gain B; cool	PDP Read/Write	11/16	3rd D7:D0 / D7:D0
			<b>GSW</b>		01	01	01	Gamma switch	PDP	10	D3:D2

			<b>WHB</b>	00	00	00	White balance 0;cool, 1;normal, 2;warm --- synchronising with user operation MENU	PDP	9	D3:D2&D1:D 0
			<b>HAPC</b>	01	01	01	Q.MODE + Heat APC	PDP	28	D4:D3
			<b>BRN</b>	01	01	01	Burn in mode	PDP	10	D5:D4
			<b>APC</b>	00	00	00	APC switch 0;High APC, 1;Normal	PDP	10	D7
	<b>MI0&gt;</b>	<b>M01&gt;</b>	<b>F01(4:3)</b>	01	01	01	Wide mode selected by 16:9 key (0;on, 1;off)	4:3		
<b>F02(16:9)</b>			00	00	00	Wide mode selected by 16:9 key (0;on, 1;off)	WIDE SCREEN			
<b>F03(C16:9L)</b>			00	00	00	Wide mode selected by 16:9 key (0;on, 1;off)	LETTERBOX			
<b>F04(T16:9L)</b>			01	01	01	Wide mode selected by 16:9 key (0;on, 1;off)	T16:9L			
<b>F05(14:9)</b>			01	01	01	Wide mode selected by 16:9 key (0;on, 1;off)	14:9			
<b>M02&gt;</b>		<b>F06(C14:9L)</b>	00	00	00	Wide mode selected by 16:9 key (0;on, 1;off)	C14:9L			
		<b>F07(T14:9L)</b>	01	01	01	Wide mode selected by 16:9 key (0;on, 1;off)	T14:9L			
		<b>F08(PAN)</b>	01	01	01	Wide mode selected by 16:9 key (0;on, 1;off)	PANORAMIC			
		<b>F09(14:9LS)</b>	00	00	00	Wide mode selected by 16:9 key (0;on, 1;off)	14:9 ZOOM			
		<b>PCA</b>	02	02	02	PC wide mode 0;NORMAL, 1;REAL, 2;FULL	FC4	3	D17:D16	
<b>M03&gt; (*2)</b>		<b>HE1</b>	02	02	02	Horizontal enhancer DYNAMIC	FC4	2	D20:D19	
		<b>HE2</b>	03	03	03	Horizontal enhancer DYNAMIC-VIDEO	FC4	2	D20:D19	
		<b>HE3</b>	00	00	00	Horizontal enhancer NATURAL	FC4	2	D20:D19	
		<b>HE4</b>	00	00	00	Horizontal enhancer NATURAL-VIDEO	FC4	2	D20:D19	
		<b>HE5</b>	01	01	01	Horizontal enhancer CINEMA	FC4	2	D20:D19	
		<b>HE6</b>	02	02	02	Horizontal enhancer CINEMA-VIDEO	FC4	2	D20:D19	
		<b>HET</b>	00	00	00	Horizontal enhancer TEXT	FC4	2	D20:D19	

			<b>M04&gt; (*2)</b>	<b>VE1</b>	03	03	03	Vertical enhancer DYNAMIC	FC4	2	D22:D21
				<b>VE2</b>	03	03	03	Vertical enhancer DYNAMIC-VIDEO	FC4	2	D22:D21
				<b>VE3</b>	03	03	03	Vertical enhancer NATURAL	FC4	2	D22:D21
				<b>VE4</b>	03	03	03	Vertical enhancer NATURAL-VIDEO	FC4	2	D22:D21
				<b>VE5</b>	03	03	03	Vertical enhancer CINEMA	FC4	2	D22:D21
				<b>VE6</b>	03	03	03	Vertical enhancer CINEMA-VIDEO	FC4	2	D22:D21
				<b>VET</b>	00	00	00	Vertical enhancer TEXT	FC4	2	D22:D21
			<b>M05&gt;</b>	<b>BGT</b>	00	00	00	Brightness/Gradation	PDP	27&28	D2&D2
				<b>CCT</b>	00	00	00	NTSC/EBU	PDP	27&28	D1&D1
				<b>TCR</b>	01	01	01	Tracking correction W/B Warm & Norm	PDP	27&28	D0&D0
				<b>DCC</b>	00	00	00	Tracking correction W/B Cool	PDP	27&28	D0&D0
				<b>WBC</b>	00	00	00				
				<b>BSO</b>	1F	1F	1F	Black Stretch gain offset ON&MID	FC4	7	D21:D16
				<b>SPC</b>	00	00	00	PinP(PC W) picture contrast offset	FC4	7	D07:D00
			<b>M06&gt;</b>	<b>PHC</b>	80	80	80	Colour phase centre	FC4	8	D07:D00
				<b>PHU</b>	1A	1A	1A	PAL HUE offset (not available if AV2 is RGB)	FC4	8	D07:D00
				<b>NHU</b>	20	20	20	NTSC HUE offset	FC4	8	D07:D00
				<b>YU6</b>	1D	1D	1D	YCbCr / YPbPr @ 60Hz HUE offset	FC4	8	D07:D00
				<b>YU5</b>	1A	1A	1A	YCbCr / YPbPr @ 50Hz HUE offset	FC4	8	D07:D00
				<b>THU</b>	1F	1F	1F	TEXT HUE offset	FC4	8	D07:D00
				<b>YHU</b>	1F	1F	1F	Components Hue for Asian option	FC4	8	D07:D00

				<b>FPB</b>	00	00	00	FAVOURITE Peak Brightness 0;Peak, 1:Normal	PDP	10	D6
		<b>MI1&gt;</b>	<b>M11&gt;</b>	<b>BLT</b>	7F	7F	7F	Black level (RGB)	FC4	5	D07:D00
				<b>MBC</b>	80	80	80	Main brightness centre: (50) is used in AUTO adjustment	FC4	7	D15:D08
				<b>MBX</b>	80	80	80	Brightness centre TEXT	FC4	7	D15:D08
				<b>COT</b>	7F	7F	7F	Contrast (RGB)	FC4	6	D07:D00
				<b>MCC</b>	89	89	89	Main contrast centre	FC4	7	D07:D00
				<b>MCX</b>	70	70	70	Contrast centre TEXT	FC4	7	D07:D00
				<b>SAC</b>	40	40	40	Saturation centre NTSC/PAL/RGB/YCbCr TV	FC4	8	D14:D08
				<b>SAX</b>	50	50	50	Saturation centre TEXT	FC4	8	D14:D08
			<b>M12&gt; (*3)</b>	<b>CE1</b>	1F	1F	1F	C-Vert/Horiz enhancer gain DYNAMIC-TV	FC4	2	D12:D08
				<b>CE2</b>	10	10	10	C-Vert/Horiz enhancer gain DYNAMIC-VIDEO	FC4	2	D12:D08
				<b>CE3</b>	1F	1F	1F	C-Vert/Horiz enhancer gain NATURAL-TV	FC4	2	D12:D08
				<b>CE4</b>	10	10	10	C-Vert/Horiz enhancer gain NATURAL-VIDEO	FC4	2	D12:D08
				<b>CE5</b>	1F	1F	1F	C-Vert/Horiz enhancer gain CINEMA-TV	FC4	2	D12:D08
				<b>CE6</b>	10	10	10	C-Vert/Horiz enhancer gain CINEMA-VIDEO	FC4	2	D12:D08
				<b>CET</b>	10	10	10	C-Vert/Horiz enhancer gain TEXT	FC4	2	D12:D08
				<b>YET</b>	00	00	00	Sharpness centre - TEXT	FC4	2	D04:D00
			<b>M13&gt;</b>	<b>YE1</b>	1F	1F	1F	Sharpness DYNAMIC-TV	FC4	2	D04:D00
				<b>YE2</b>	12	12	12	Sharpness DYNAMIC-VIDEO	FC4	2	D04:D00
				<b>YE3</b>	12	12	12	Sharpness NATURAL-TV	FC4	2	D04:D00
				<b>YE4</b>	12	12	12	Sharpness NATURAL-VIDEO	FC4	2	D04:D00

				<b>YE5</b>	12	12	12	Sharpness CINEMA-TV	FC4	2	D04:D00
				<b>YE6</b>	12	12	12	Sharpness CINEMA-VIDEO	FC4	2	D04:D00
				<b>YE7</b>	12	12	12	Sharpness centre-FAVOURITE-TV	FC4	2	D04:D00
				<b>YE8</b>	12	12	12	Sharpness centre-FAVOURITE-VIDEO	FC4	2	D04:D00
			<b>M14&gt; (*4)</b>	<b>YI1</b>	01	01	01	YNR input gain DYNAMIC	FC4	2	D07:D05
				<b>YI2</b>	01	01	01	YNR input gain DYNAMIC-VIDEO	FC4	2	D07:D05
				<b>YI3</b>	01	01	01	YNR input gain NATURAL	FC4	2	D07:D05
				<b>YI4</b>	01	01	01	YNR input gain NATURAL-VIDEO	FC4	2	D07:D05
				<b>YI5</b>	01	01	01	YNR input gain CINEMA	FC4	2	D07:D05
				<b>YI6</b>	01	01	01	YNR input gain CINEMA-VIDEO	FC4	2	D07:D05
				<b>YIT</b>	01	01	01	YNR input gain TEXT	FC4	2	D07:D05
			<b>M15&gt; (*5)</b>	<b>CI1</b>	00	00	00	CNR input gain DYNAMIC	FC4	2	D15:D13
				<b>CI2</b>	00	00	00	CNR input gain DYNAMIC-VIDEO	FC4	2	D15:D13
				<b>CI3</b>	00	00	00	CNR input gain NATURAL	FC4	2	D15:D13
				<b>CI4</b>	00	00	00	CNR input gain NATURAL-VIDEO	FC4	2	D15:D13
				<b>CI5</b>	00	00	00	CNR input gain CINEMA	FC4	2	D15:D13
				<b>CI6</b>	00	00	00	CNR input gain CINEMA-VIDEO	FC4	2	D15:D13
				<b>CIT</b>	00	00	00	CNR input gain TEXT	FC4	2	D15:D13
			<b>M16&gt;</b>	<b>OSH</b>	109	109	109	H position - OSD			
				<b>OSV</b>	40	40	40	V position - OSD			
				<b>OTH</b>	190	190	190	H position - TEXT			



				OTV	40	40	40	V position - TEXT			
				SUR	00	00	00	SURROUND ON:1, OFF:0			
				CMB	01	01	01	COMB FILTER ON;1, OFF;0			
		MI2> (*6)	M21>	DCN	3E	3E	3E	DYNAMIC Contrast			
				DBR	80	80	80	DYNAMIC Brightness			
				DCL	50	50	50	DYNAMIC Colour			
				DPB	00	00	00	DYNAMIC Peak Brightness 0;Peak, 1:Normal	PDP	10	D6
				DCM	02	02	02	DYNAMIC Contrast Mode NORM;0, AUTO;1, DYN;2			
				DBS	1F	1F	1F	DYNAMIC Black stretch 0;off, 01~3F; level			
				DWB	00	00	00	DYNAMIC White Balance 0:cool, 1:normal, 2:warm			
				DFT	01	01	01	DYNAMIC Film Mode 0;on, 1;off			
			M22>	NCN	38	38	38	NATURAL Contrast			
				NBR	80	80	80	NATURAL Brightness			
				NCL	48	48	48	NATURAL Colour			
				NPB	00	00	00	NATURAL Peak Brightness 0;Peak, 1:Normal	PDP	10	D6
				NCM	01	01	01	NATURAL Contrast Mode NORM;0, AUTO;1, DYN;2			
				NBS	1A	1A	1A	NATURAL Black stretch 0;off, 01~3F; level			
				NWB	00	00	00	NATURAL White Balance 0:cool, 1:normal, 2:warm			
				NFT	01	01	01	NATURAL Film Mode 0;on, 1;off			
			M23>	TCN	3E	3E	3E	CINEMA Contrast			
				TBR	80	80	80	CINEMA Brightness			

				<b>TCL</b>	50	50	50	CINEMA Colour			
				<b>TPB</b>	00	00	00	CINEMA Peak Brightness 0;Peak, 1:Normal	PDP	10	D6
				<b>TCM</b>	00	00	00	CINEMA Contrast Mode NORM;0, AUTO;1, DYN;2			
				<b>TBS</b>	1F	1F	1F	CINEMA Black stretch 0;off, 01~3F; level			
				<b>TWB</b>	01	01	01	CINEMA White Balance 0:cool, 1:normal, 2;warm			
				<b>TFT</b>	00	00	00	CINEMA Film Mode 0;on, 1;off			
			<b>M24&gt;</b>	<b>DGS</b>	01	01	01	DYNAMIC Gamma Select			
				<b>NGS</b>	01	01	01	NATURAL Gamma Select			
				<b>TGS</b>	01	01	01	CINEMA Gamma Select			
				<b>PGS</b>	02	02	02	PERSONAL Gamma Select			
				<b>DPM</b>	00	00	00	DYNAMIC Picture Mode			
				<b>NPM</b>	01	01	01	NATURAL Picture Mode			
				<b>TPM</b>	01	01	01	CINEMA Picture Mode			
				<b>PPM</b>	02	02	02	PERSONAL Picture Mode			
		<b>MI3&gt; (*7)</b>	<b>M31&gt;</b>	<b>MVB</b>	0B	0B	0B	MUSIC Volume Balance			
				<b>MTR</b>	0B	0B	0B	MUSIC Treble			
				<b>MBA</b>	0B	0B	0B	MUSIC Bass			
				<b>MTB</b>	03	03	03	MUSIC TruBass 0;off, 1;low, 2;mid, 3;high			
				<b>MMS</b>	01	01	01	MUSIC Matrix Surround 0;off, 1;on			
			<b>M32&gt;</b>	<b>NVB</b>	0B	0B	0B	SPEECH Volume Balance			
				<b>NTR</b>	10	10	10	SPEECH Treble			

				NBA	0B	0B	0B	SPEECH Bass					
				NTB	00	00	00	SPEECH TruBass 0;off, 1;low, 2;mid, 3;high					
				NMS	00	00	00	SPEECH Matrix Surround 0;off, 1;on					
			M33>		TVB	0B	0B	0B	CINEMA Volume Balance				
					TTR	10	10	10	CINEMA Treble				
					TBA	10	10	10	CINEMA Bass				
					TTB	02	02	02	CINEMA TruBass 0;off, 1;low, 2;mid, 3;high				
					TMS	01	01	01	CINEMA Matrix Surround 0;off, 1;on				
			MI4> (*8)	M41>		TSW	00	00	00	TDA9178 fitted or not. 0:not fitted, 1;fitted			
					TC1	01	01	01	TDA9178 address 00		TDA9178	00	D07:D00
					TC2	10	10	10	TDA9178 address 01		TDA9178	01	D05:D00
					TC3	00	00	00	TDA9178 address 02		TDA9178	02	D07:D00
					TC4	00	00	00	TDA9178 address 03		TDA9178	03	D05:D00
					ABS	00	00	00	TDA9178 address 04		TDA9178	04	D05:D00
		M42>			NLA	00	00	00	TDA9178 address 05		TDA9178	05	D05:D00
					VGM	20	20	20	TDA9178 address 06		TDA9178	06	D05:D00
					PKG	00	00	00	TDA9178 address 07		TDA9178	07	D05:D00
					STP	00	00	00	TDA9178 address 08		TDA9178	08	D05:D00
					CRG	00	00	00	TDA9178 address 09		TDA9178	09	D05:D00
					LWD	00	00	00	TDA9178 address 0A		TDA9178	0A	D05:D00
		M43> (*8)			1RD	14	14	14	White balance offset 1; R_DRIVE MAX				

			<b>(*9)</b>	<b>1GD</b>	0F	0F	0F	White balance offset 1; G_DRIVE	
				<b>1BD</b>	00	00	00	White balance offset 1; B_DRIVE	
				<b>1RG</b>	1F	1F	1F	White balance offset 1; R_GAMMA	
				<b>1GG</b>	1F	1F	1F	White balance offset 1; G_GAMMA	
				<b>1BG</b>	1F	1F	1F	White balance offset 2; B_GAMMA	
			<b>M44&gt;</b>	<b>2RD</b>	00	00	00	White balance offset 2; R_DRIVE CENTRE	
				<b>2GD</b>	00	00	00	White balance offset 2; G_DRIVE	
				<b>2BD</b>	00	00	00	White balance offset 2; B_DRIVE	
				<b>2RG</b>	1F	1F	1F	White balance offset 2; R_GAMMA	
				<b>2GG</b>	1F	1F	1F	White balance offset 2; G_GAMMA	
				<b>2BG</b>	1F	1F	1F	White balance offset 2; B_GAMMA	
			<b>M45&gt;</b>	<b>3RD</b>	00	00	00	White balance offset 3; R_DRIVE MIN	
				<b>3GD</b>	0F	0F	0F	White balance offset 3; G_DRIVE	
				<b>3BD</b>	29	29	29	White balance offset 3; B_DRIVE	
				<b>3RG</b>	1F	1F	1F	White balance offset 3; R_GAMMA	
				<b>3GG</b>	1F	1F	1F	White balance offset 3; G_GAMMA	
				<b>3BG</b>	1F	1F	1F	White balance offset 3; B_GAMMA	
		<b>MI5&gt;</b>	<b>M51&gt; (*10)</b>	<b>CEA</b>	0D	0D	0D	C-Vert/Horiz enhancer gain DYNAMIC-RGB/YCbCr	
				<b>CEB</b>	0D	0D	0D	C-Vert/Horiz enhancer gain DYNAMIC-YPbPr	
				<b>CEC</b>	0D	0D	0D	C-Vert/Horiz enhancer gain NATURAL-RGB/YCbCr	
				<b>CED</b>	0D	0D	0D	C-Vert/Horiz enhancer gain NATURAL-YPbPr	

				<b>CEE</b>	0D	0D	0D	C-Vert/Horiz enhancer gain CINEMA-RGB/YCbCr	
				<b>CEF</b>	0D	0D	0D	C-Vert/Horiz enhancer gain CINEMA-YPbPr	
				<b>CEM</b>	10	10	10	CTI MID level in menu (FAVOURUTE)	
			<b>M52&gt;</b>	<b>YEA</b>	10	10	10	Sharpness DYNAMIC-RGB/YCbCr	
				<b>YEB</b>	10	10	10	Sharpness DYNAMIC-YPbPr	
				<b>YEC</b>	08	08	08	Sharpness NATURAL-RGB/YCbCr	
				<b>YED</b>	02	02	02	Sharpness NATURAL-YPbPr	
				<b>YEE</b>	10	10	10	Sharpness CINEMA-RGB/YCbCr	
				<b>YEF</b>	10	10	10	Sharpness DYNAMIC-YPbPr	
				<b>YE9</b>	10	10	10	Sharpness centre on FAVOURITE-RGB/YCbCr	
				<b>YE0</b>	10	10	10	Sharpness centre on FAVOURITE-YPbPr	
			<b>M53&gt;</b>	<b>LC1</b>	1F	1F	1F	Favourite + TV; last CTI	
				<b>LC2</b>	10	10	10	Favourite + Video; last CTI	
				<b>LC3</b>	0D	0D	0D	Favourite + RGB/YCbCr; last CTI	
				<b>LC4</b>	0D	0D	0D	Favourite + YPbPr; last CTI	
			<b>M54&gt;</b>	<b>DCV</b>	<b>50</b>	<b>50</b>	<b>50</b>	DYNAMIC + VIDEO/RGB; colour	
				<b>NCV</b>	<b>3E</b>	<b>3E</b>	<b>3E</b>	NATURAL + VIDEO/RGB; colour	
				<b>TCV</b>	40	40	40	CINEMA + VIDEO/RGB; colour	
				<b>SAV</b>	<b>3E</b>	<b>3E</b>	<b>3E</b>	FAVOURITE + VIDEO/RGB; colour	
				<b>DCO</b>	58	58	58	DYNAMIC + YCbCr/YPbPr; colour	
				<b>NCO</b>	4B	4B	4B	NATURAL + YCbCr/YPbPr; colour	

			TCO	50	50	50	CINEMA + YCbCr/YPbPr; colour	
			SAO	44	44	44	FAVOURITE + YCbCr/YPbPr; colour	
OPT>	OB0			78	78	78	Option byte 1	
	OB1			80	80	80	Option byte 2	
	EMG			0	0	0	0:Normal, 1:Macrovision improved	
	AV DELAY			OFF	OFF	OFF		
	RGB Comb			OFF	OFF	OFF	ON;Go through Comb, OFF;skip Comb It is affected to SVC>MIS>M11>M11=HP2/4	
	FC4						Enters FC4 sub menu	
	ASIAN OPTIONS>	AV2		RGB	RGB	RGB	RGB or YUV	
		INITIAL INSTALL		ON	ON	ON	INITIAL INSTALL menu is on or off	
		COUNTRY SELECT		ON	ON	ON	Country select is on or off	
		LANGUAGE SELECT		ON	ON	ON	European language select is on or off	
		TELETEXT		ON	ON	ON	TELETEXT is working or not	
HOT>	OPT			0	0	0	Hotel option	
	VOL			CENTRE	CENTRE	CENTRE	Maximum volume limited in Hotel mode	
	PRG			1	1	1	Start up position number	
VRS>	MN			READ	READ	READ	Model name	
	MSU			READ	READ	READ	MSU micro version number	
	PDU			READ	READ	READ	PDP micro version number	
	PWT			READ	READ	READ	PDP working hour	

	<b>E2&gt;</b>	<b>E2R</b>	OK	OK	OK	EEPROM reset	
		<b>E2F</b>	OK	OK	OK	EEPROM factory setting	
		<b>E2S</b>	OK	OK	OK	EEPROM is set to the shipment	
		<b>E24</b>	OK	OK	OK	EEPROM in FC4 is initialised	
		<b>EXS</b>	OK	OK	OK	Escape from service menu	

**Notes:**

(\*1): Maximum of 8 items on one page.

(\*2): LTI picture mode.

(\*3): CTI picture mode.

(\*4): YNR picture mode.

(\*5): CNR picture mode.

(\*6): [ ]; Menu related value is decimal, it is ok to display in hex. E.g. [32] is centre of CONTRAST, [63] is MAX for CONTRAST.

(\*7): [ ]; Menu related value is decimal, it is ok to display in hex. E.g. [11] is centre of BALANCE, [21] is MAX for TREBLE.

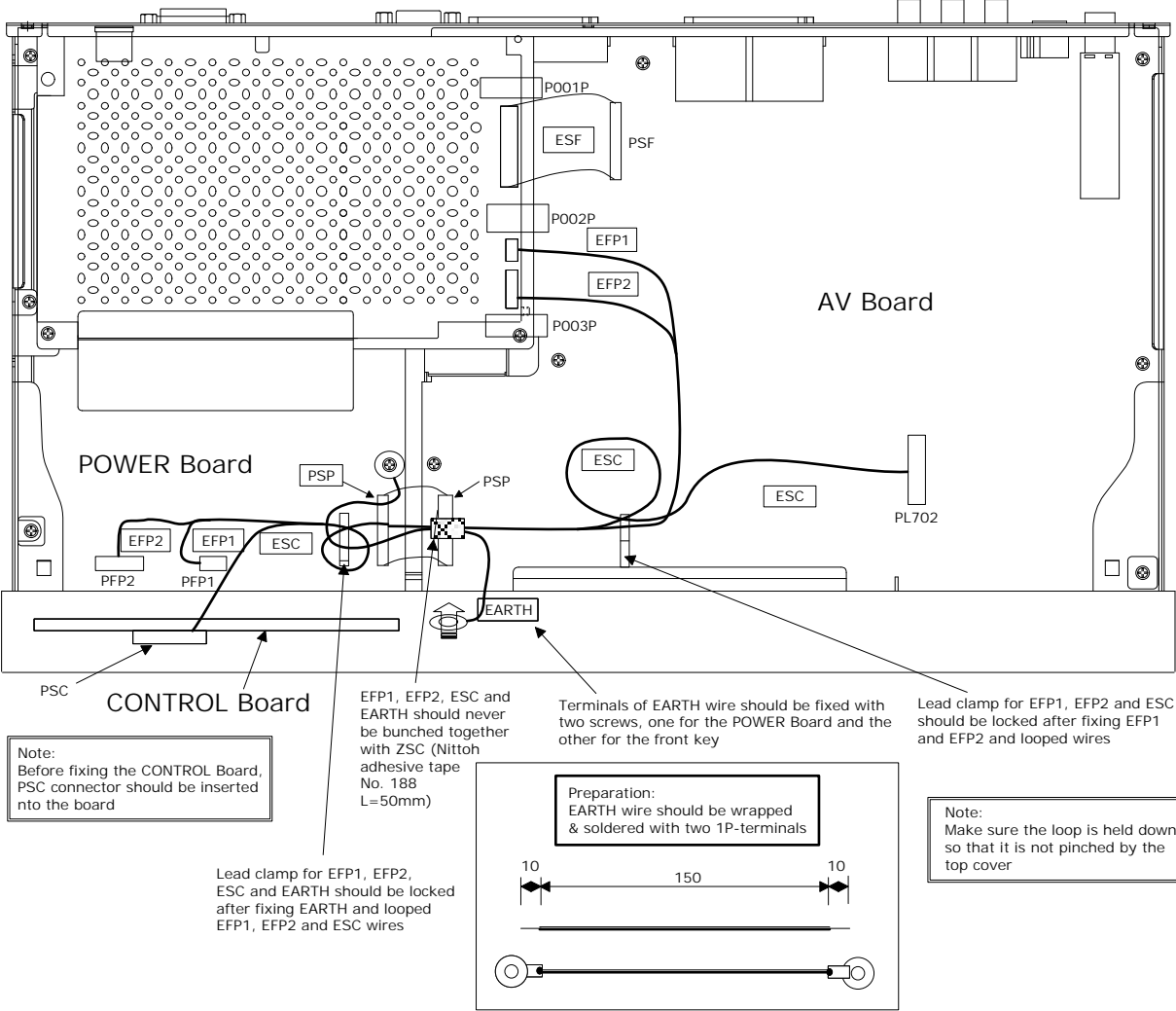
(\*8): TDA9178 option. Values are fixed in this menu. No individual parameter on TC1~TC4 can be set.

(\*9): WB Offset OFF/1/2/3 option.

(\*10): Add 27 bytes.

9. UNIT WIRING DIAGRAM

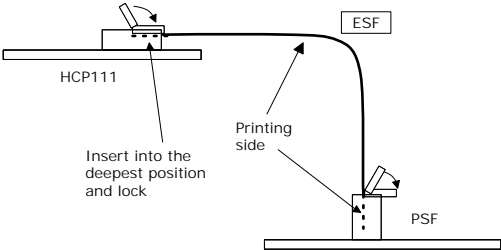
9.1. AVC Unit



Specification

1. This Drawing shows the wire dressing and connection of the AVC3-E Final Assembly.
2. Connectors with wire should be inserted into plug pin posts as shown on the table below:
3. For plug pin posts with lock function, connector housings should be inserted deep enough so that it can be locked.
4. For plug pin posts without lock function, connector housings should be inserted as deeply as possible.
5. Flexible flat cable ESF should be fixed as shown on the drawing below:

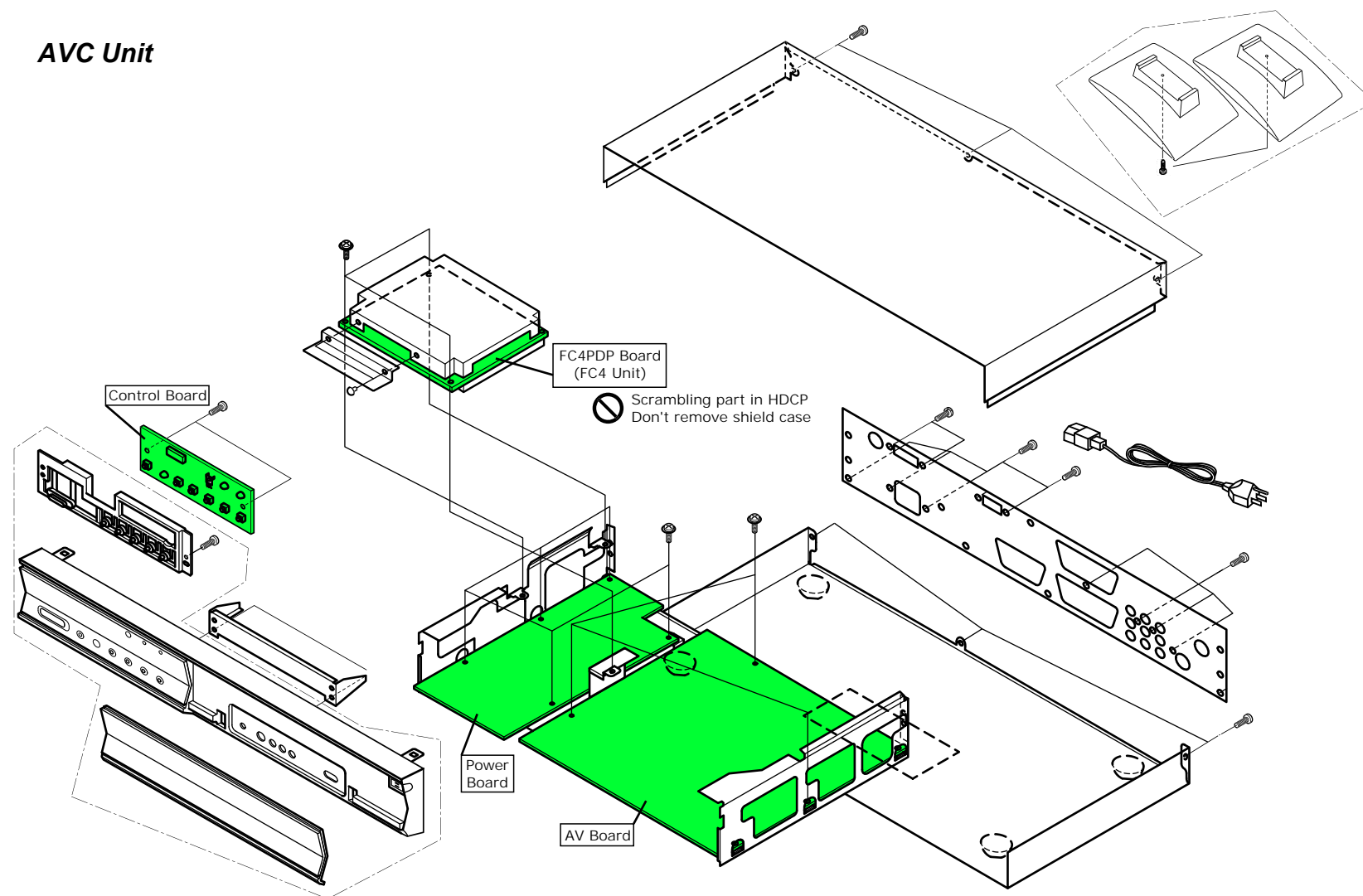
Connectors with wire		Plug Pin 1		Plug Pin 2	
Name	Assembly list	Board	Name	Board	Name
ESC	FINAL Assembly	CONTROL Brd	PSC	AV Board	PL702
EFP1	FINAL Assembly	POWER Board	PFP1	HCP111	P002P
EFP2	FINAL Assembly	POWER Board	PFP2	HCP111	P003P
ESF	FINAL Assembly	AV Board	PSF	HCP111	P001
PSP	POWER Board	AV Board	PSP	-	-



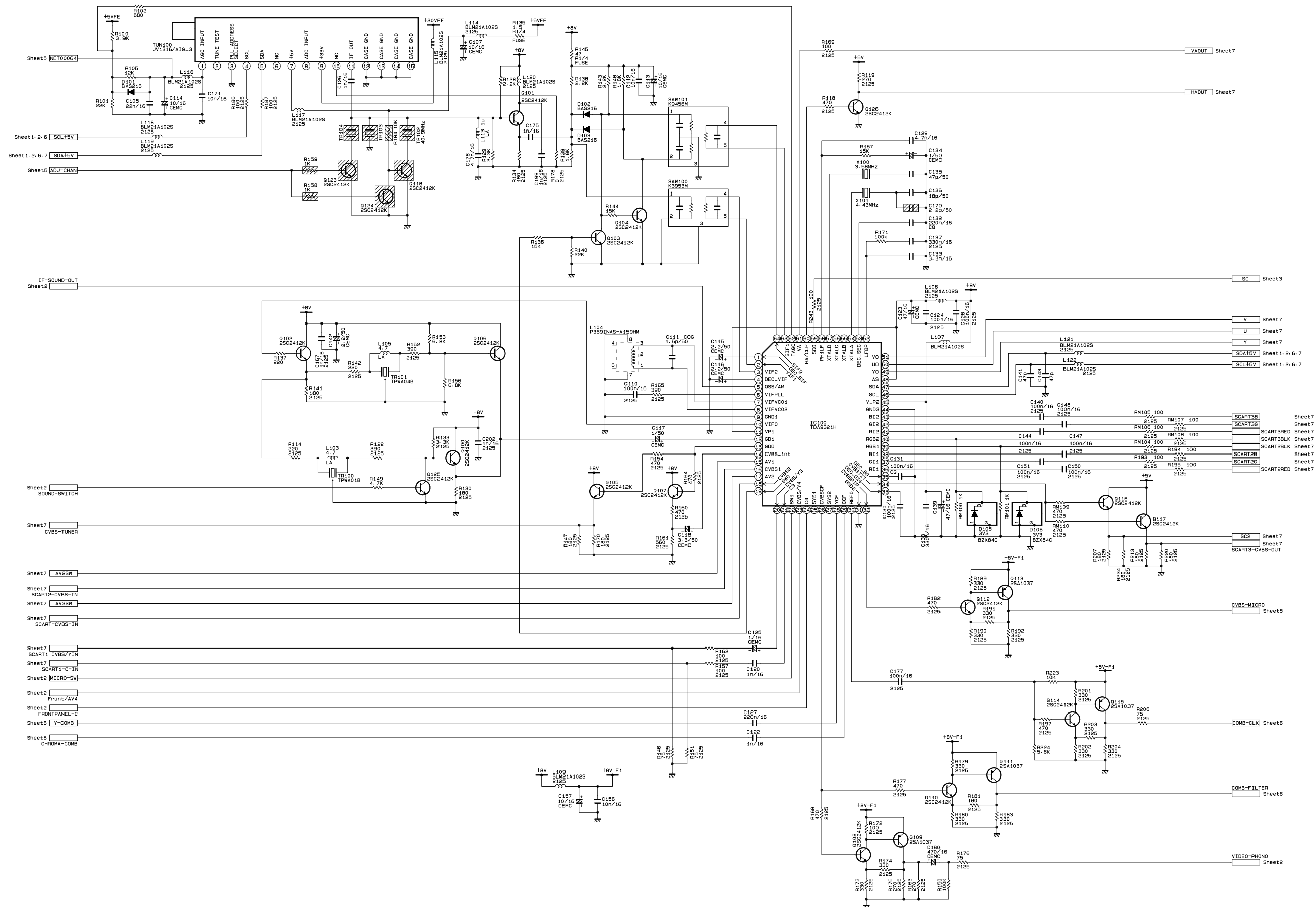


## 10. ASSEMBLY DIAGRAM

### 10.1. AVC Unit



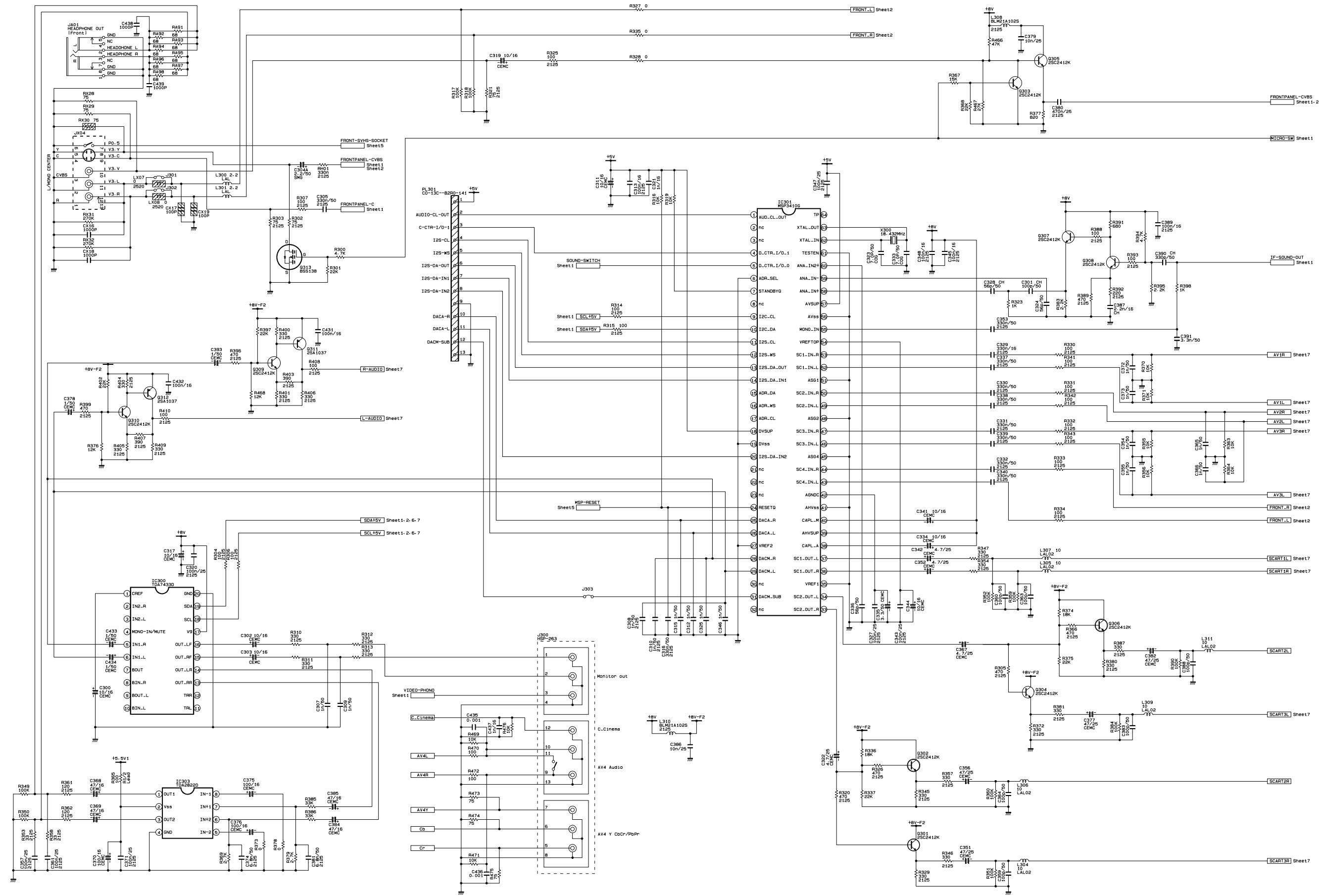
## 11. SCHEMATIC DIAGRAMS



SM00033

# AV BOARD - Tuner/Video Chroma

# HITACHI

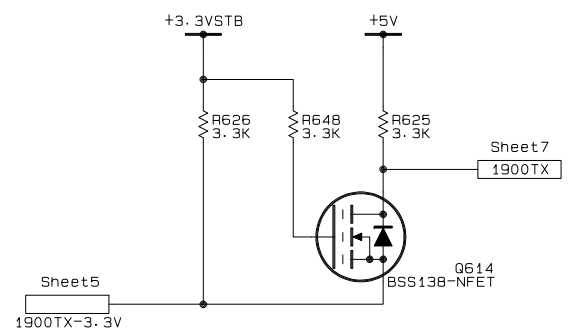
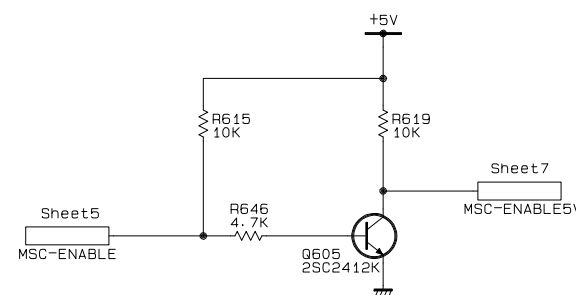
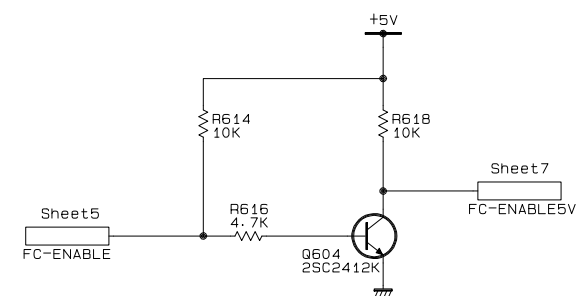
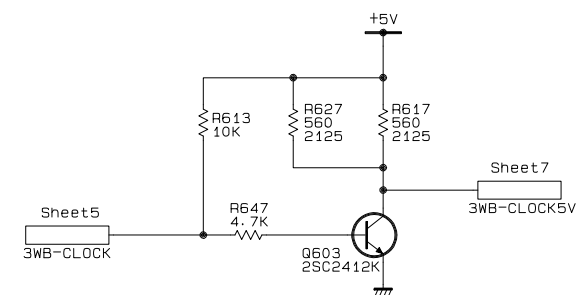
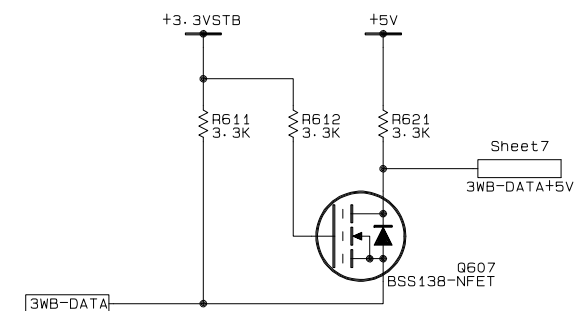
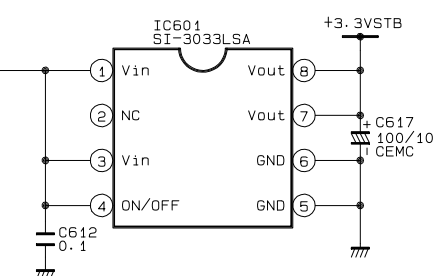
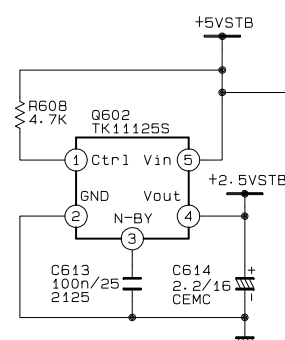
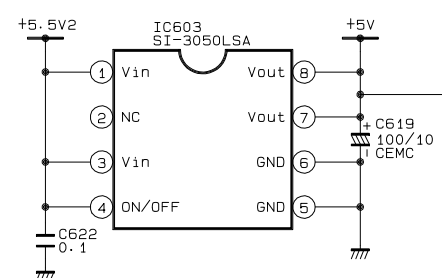
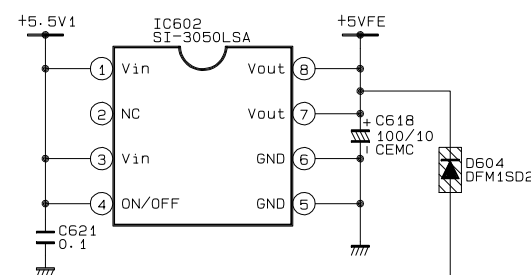
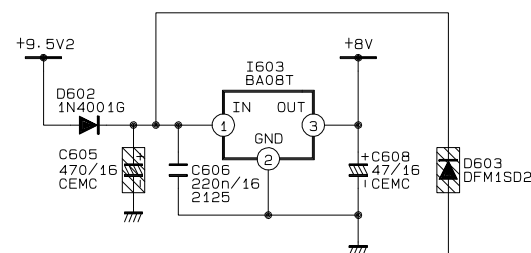
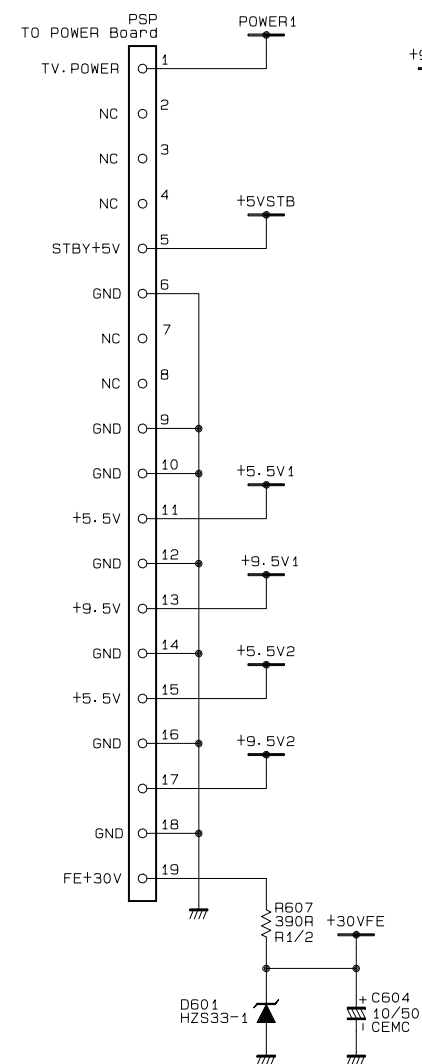


SM00033

AV BOARD - Sound/AV3 Control

HITACHI





SM00033

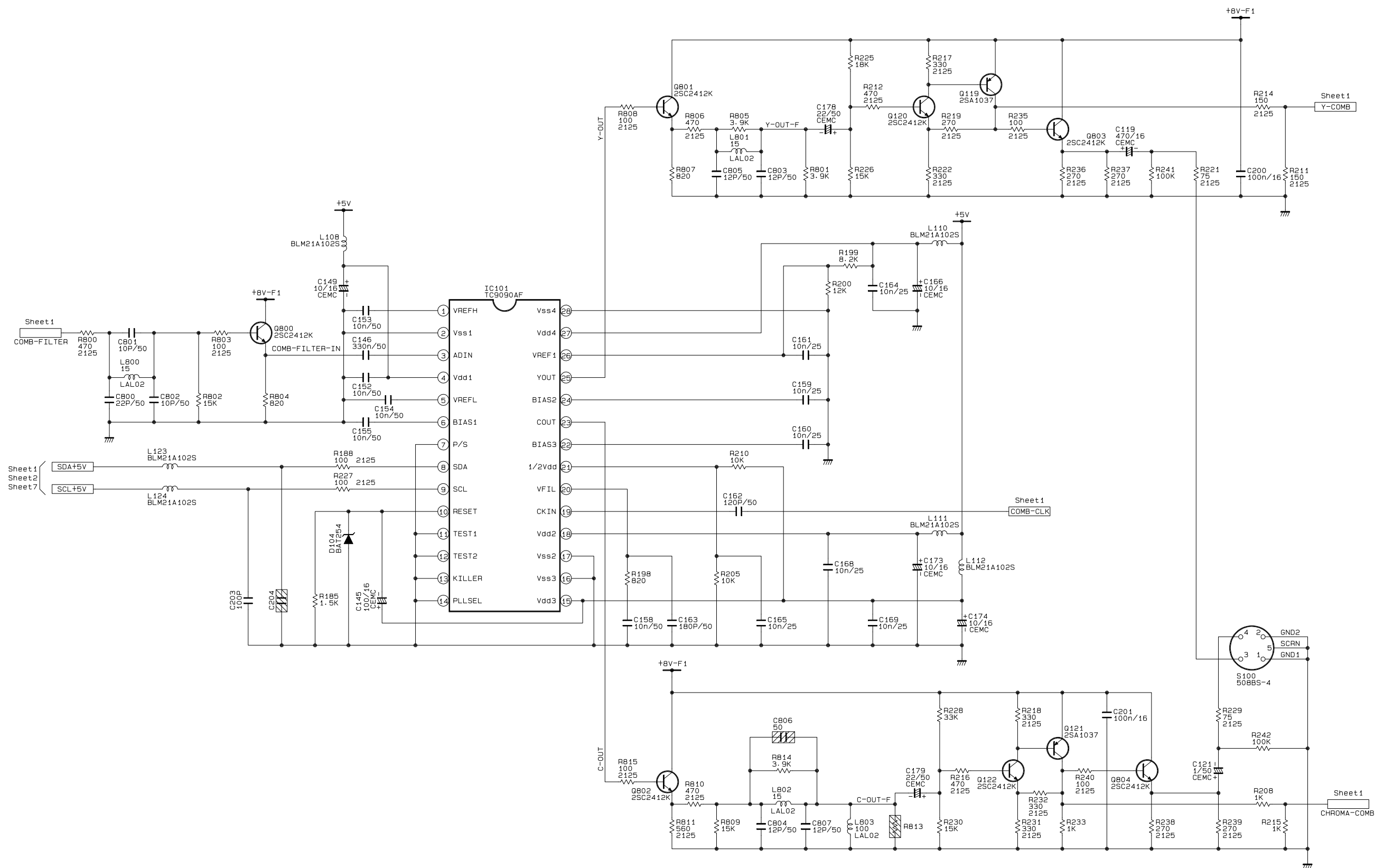
AV BOARD - Power Circuit (Voltage Regulator)/Level Shifter

HITACHI

SM00033

## AV BOARD - Micro-controller

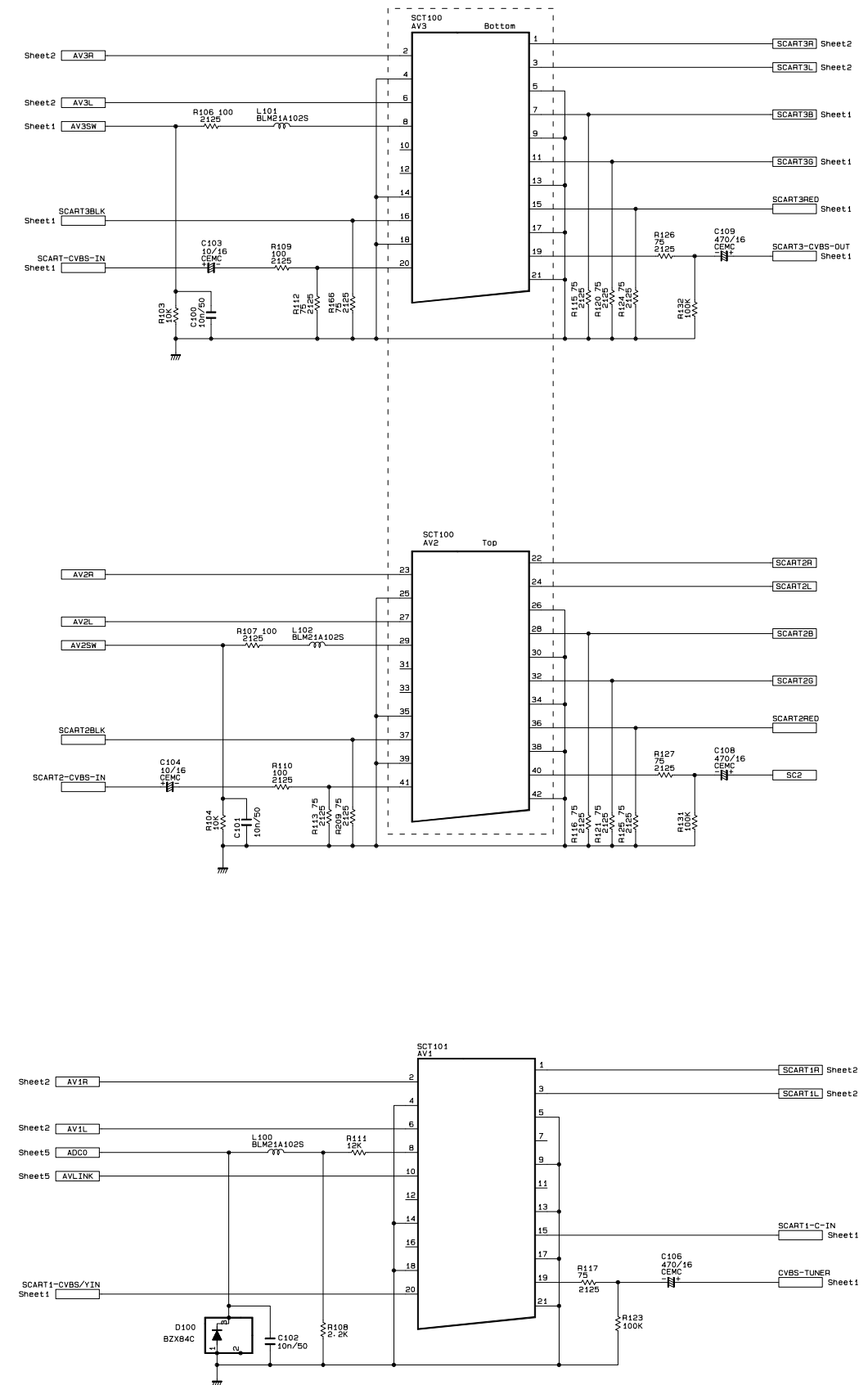
# HITACHI



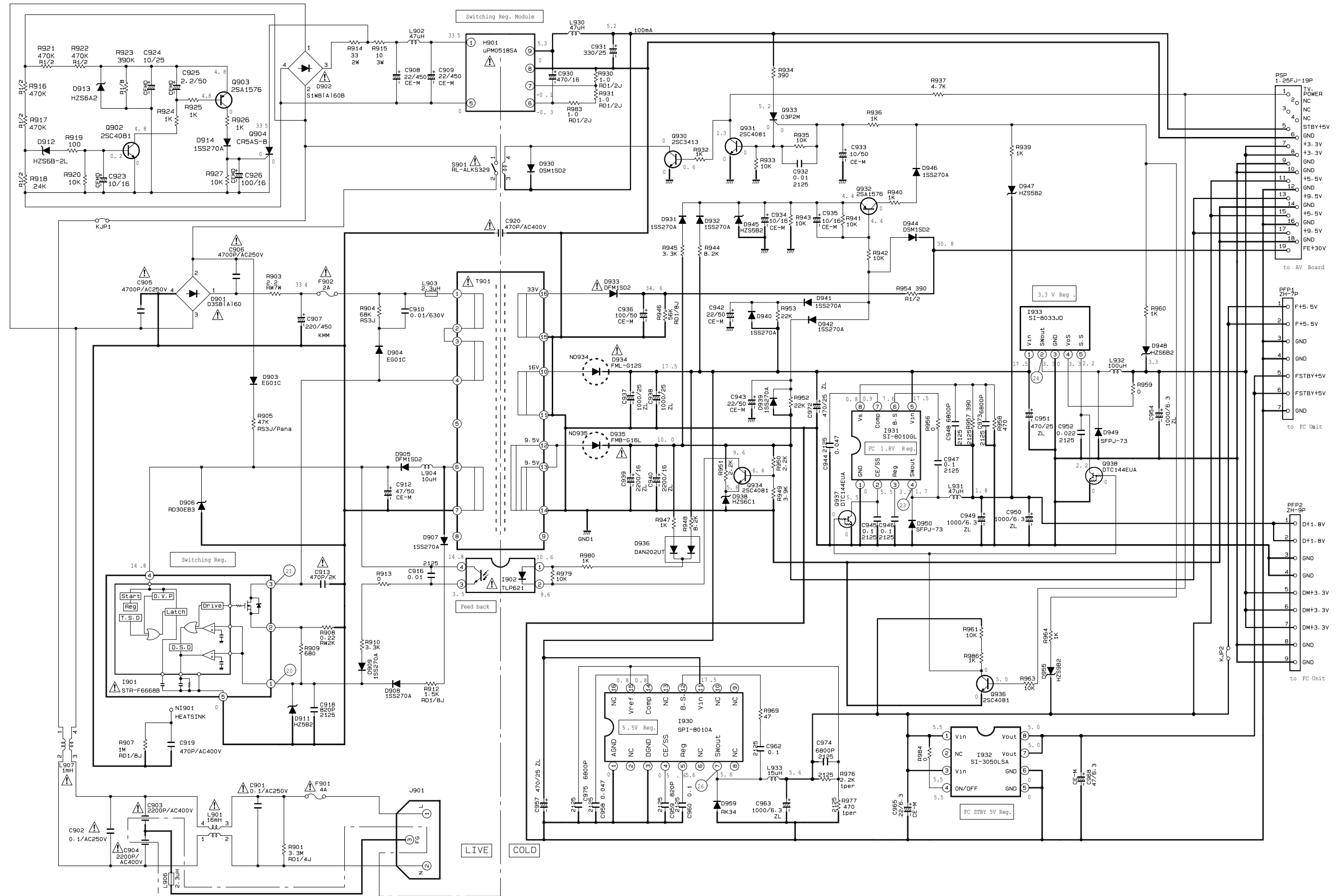
SM00033

AV BOARD - COMB Filter/SVHS Output

HITACHI



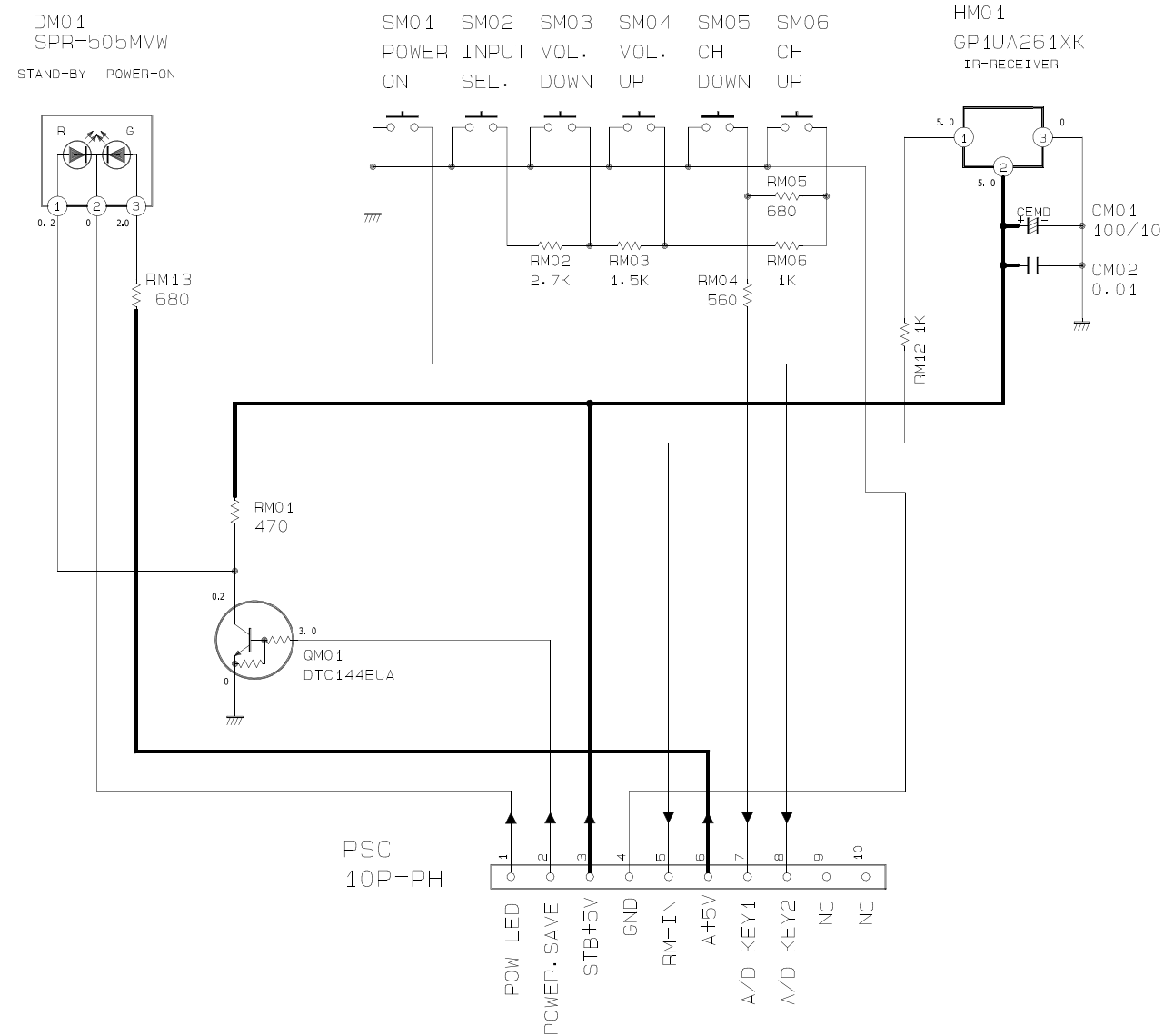




SM00033

AV POWER BOARD

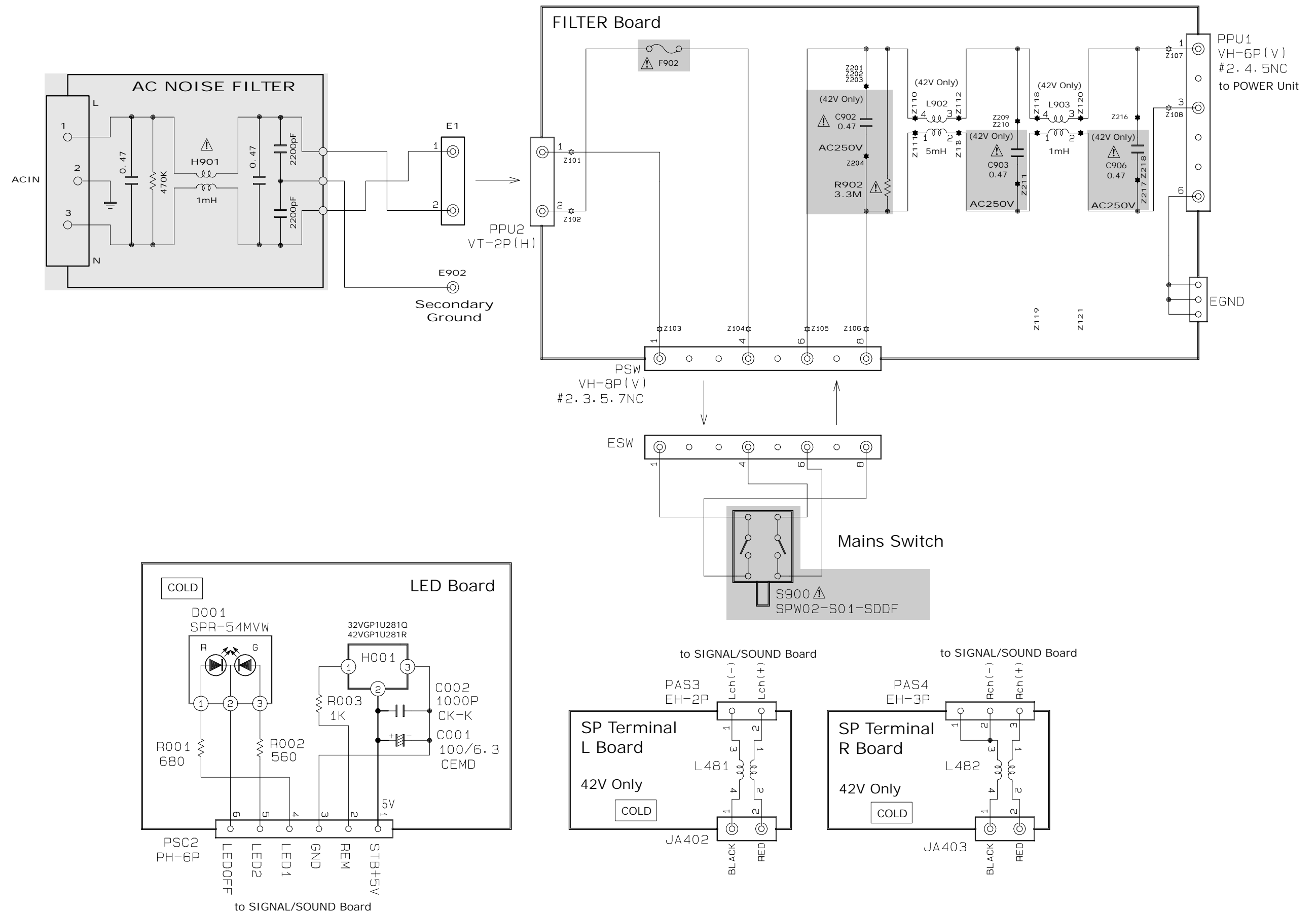
HITACHI



SM00033

CONTROL BOARD

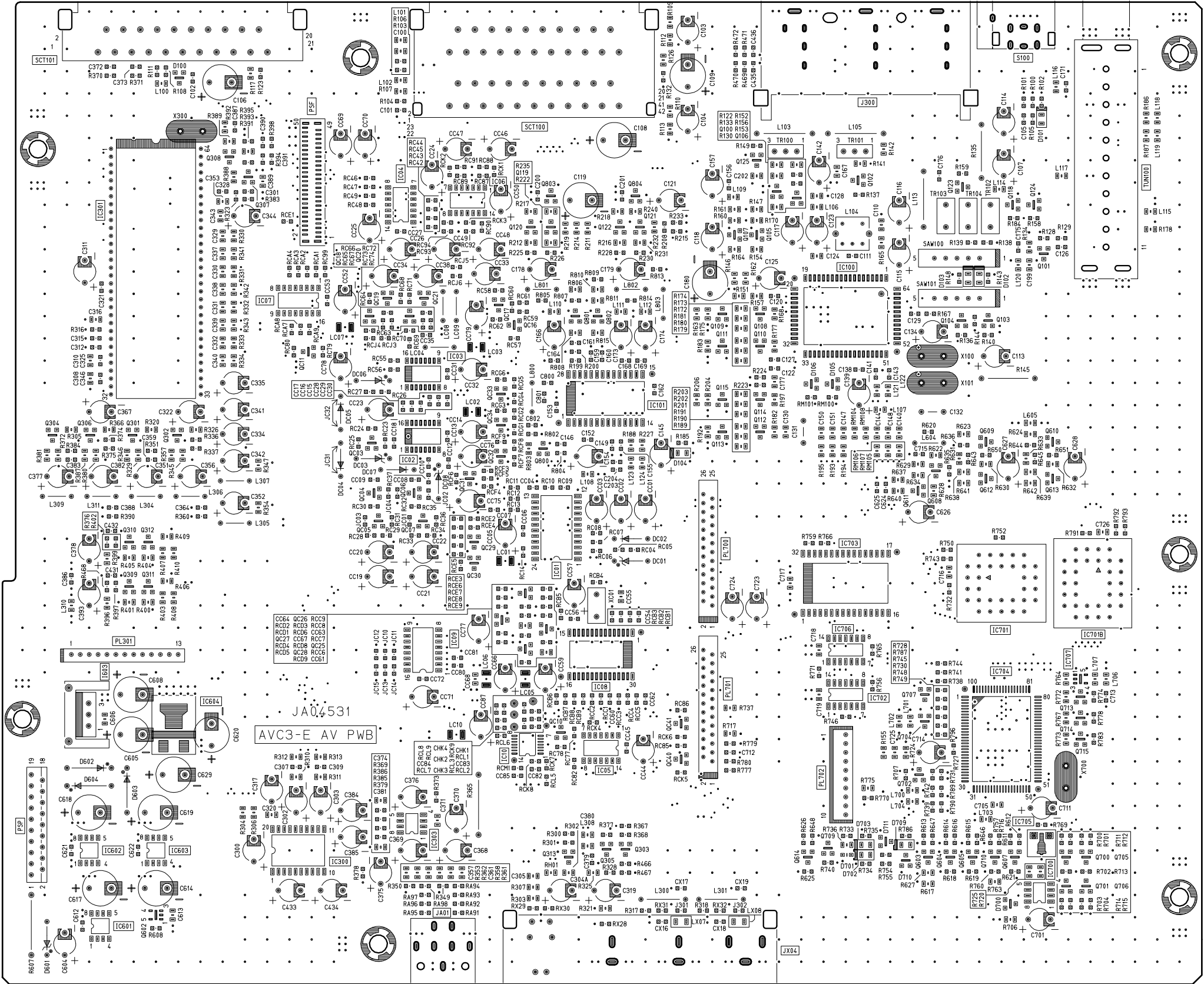
**HITACHI**



SM00033

MAINS SWITCH, FILTER, SPEAKER L/R & LED BOARDS

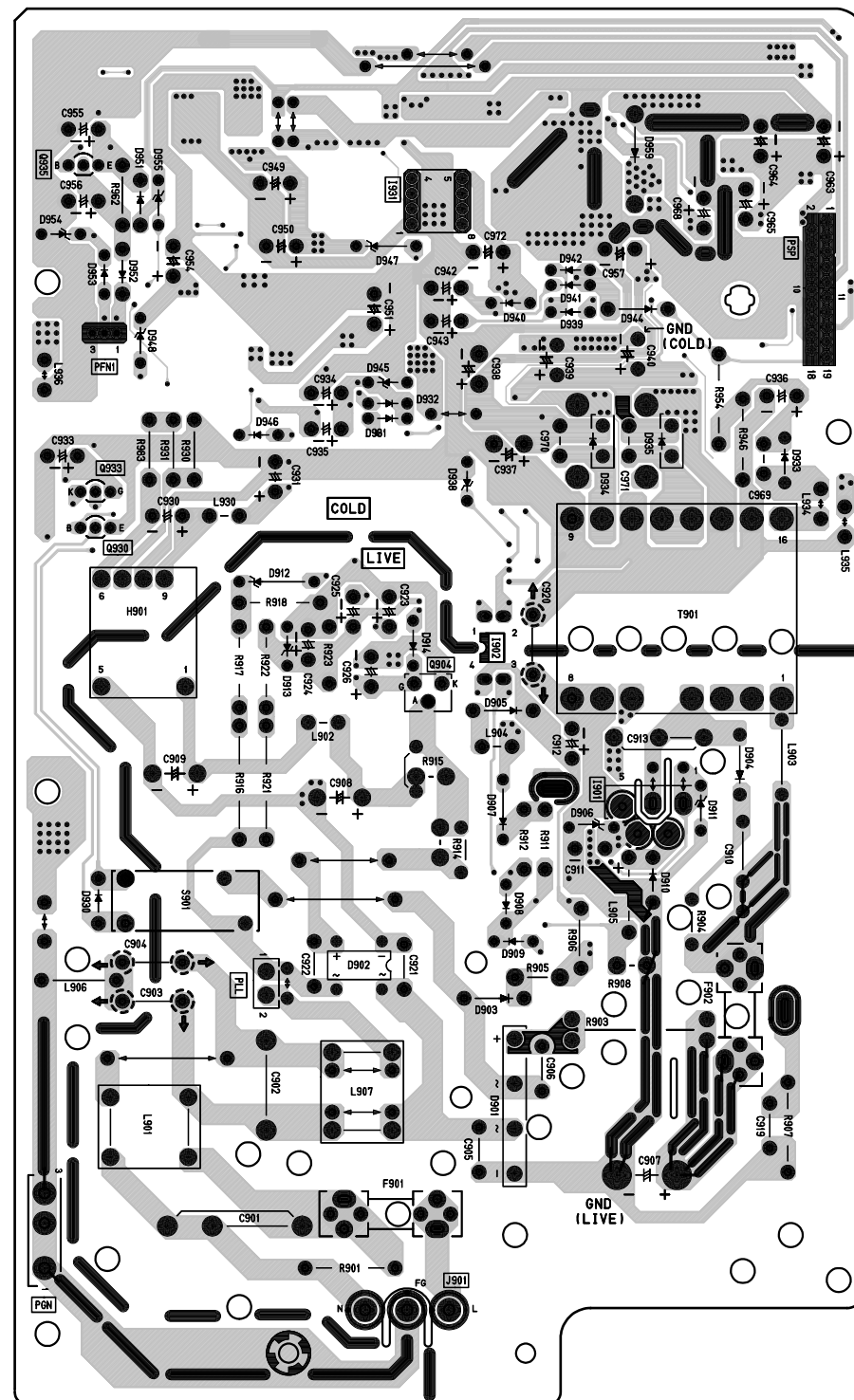
**HITACHI**



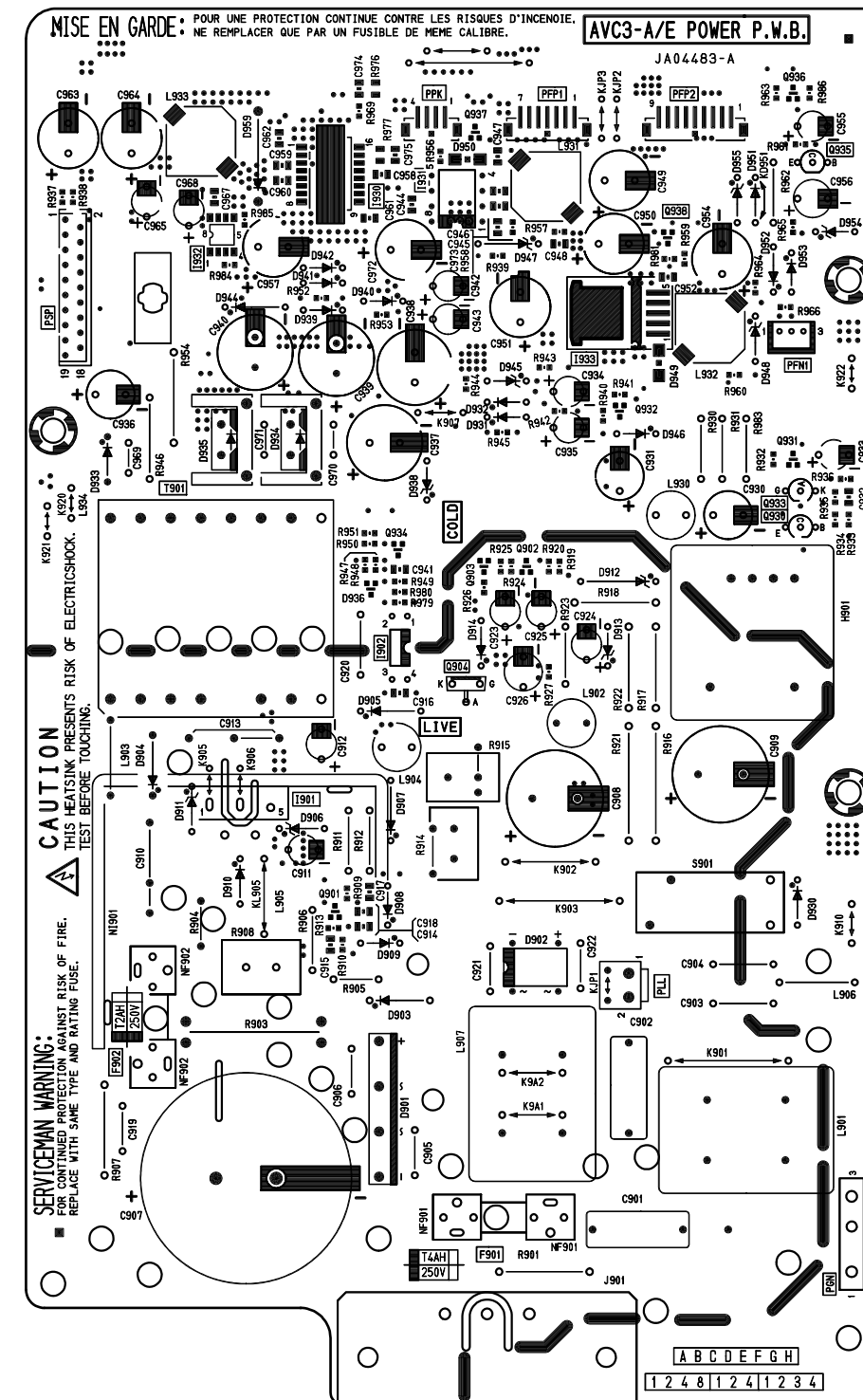
TOP (COMPONENT) SIDE  
AV BOARD

SM00033

HITACHI



BOTTOM (SOLDER) SIDE



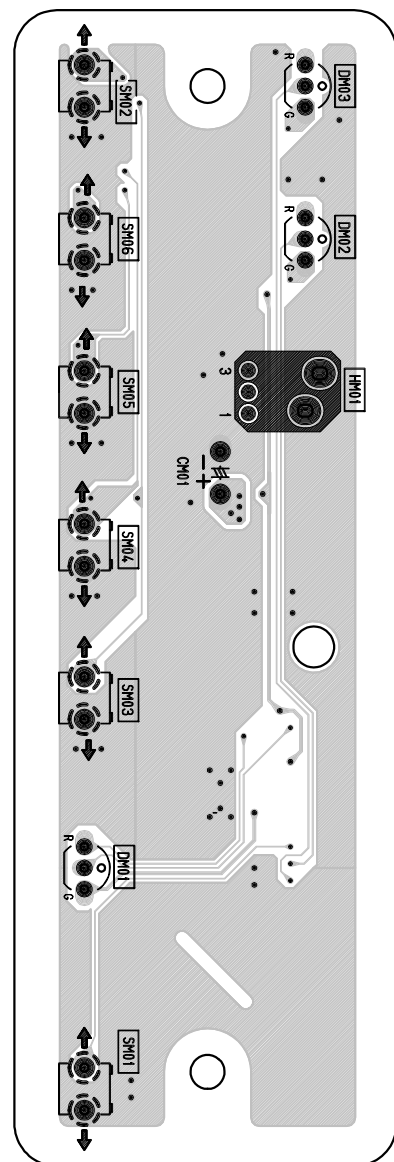
TOP (COMPONENT) SIDE

SM00033

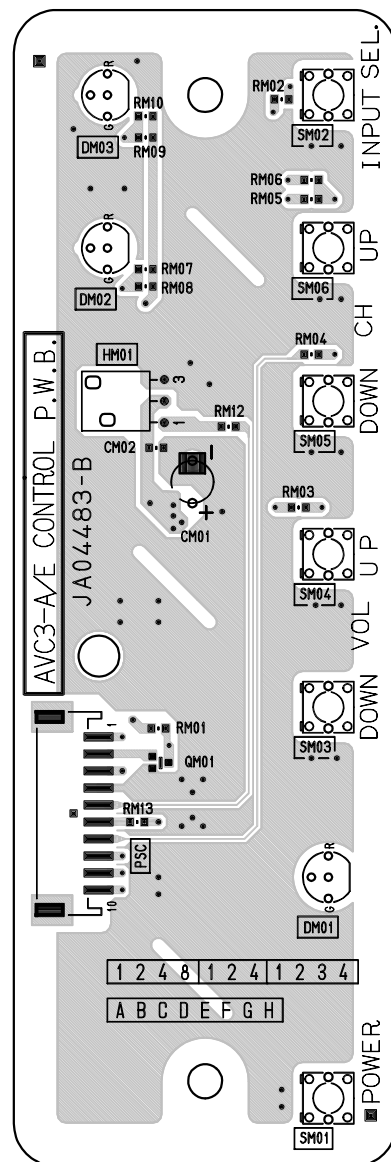
POWER BOARD

HITACHI

BOTTOM (SOLDER)  
SIDE

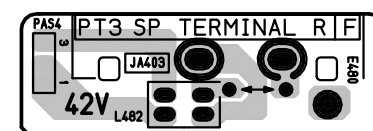


TOP (COMPONENT)  
SIDE

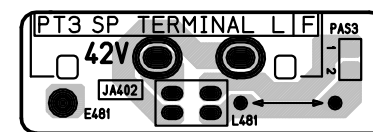


CONTROL BOARD

(R) BOARD

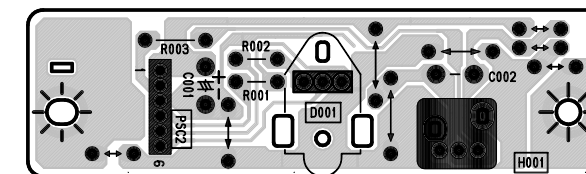


(L) BOARD

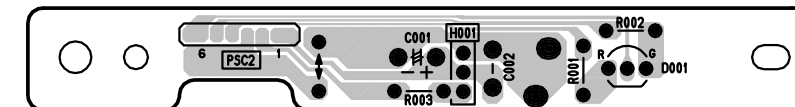


SPEAKER TERMINAL  
BOARD (42V ONLY)

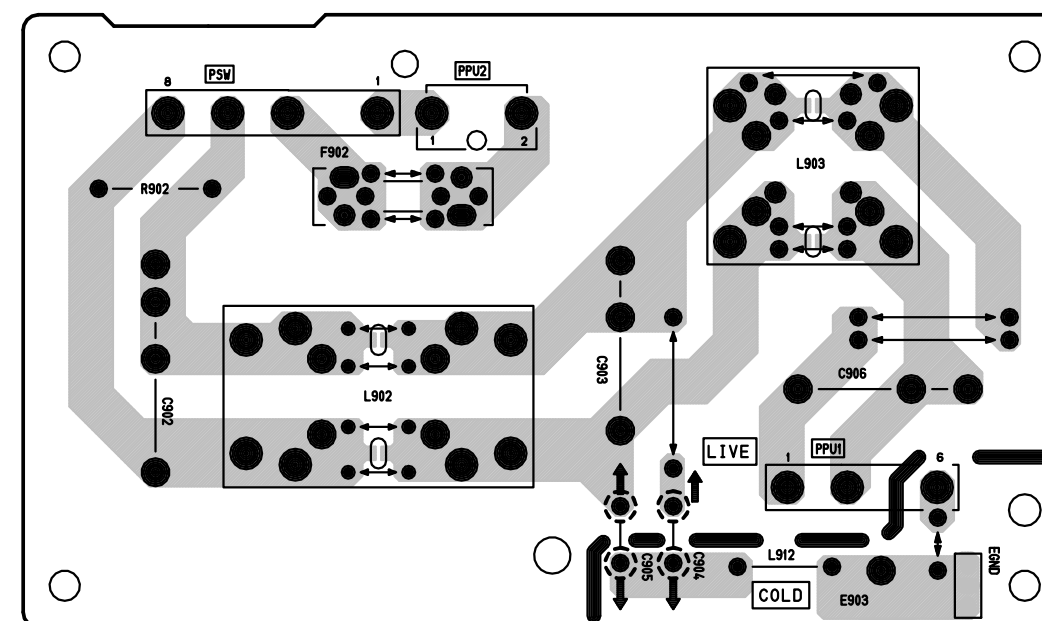
LED BOARD FOR 32V



LED BOARD FOR 42V



LED BOARD



FILTER BOARD

SM00033

CONTROL, SPEAKER, LED & FILTER BOARDS

HITACHI

**THE UPDATED PARTS LIST  
FOR THIS MODEL IS  
AVAILABLE ON ESTA**

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